DRXTH-AS-IA-82316B

INSTALLATION ASSESSMENT OF THE U.S. ARMY GARRISON, FORT PICKETT, BLACKSTONE, VA. REPORT NO. 316B

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April 1982

Prepared for:

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Fort Lee, Va. 23801

U.S. ARMY TOXIC AND HAZARDOUS MATERIALS AGENCY
Assessment Division
Aberdeen Proving Ground, Md. 21010

Unclassified

SECURITY CLASSIFICATION OF THIS PAGE (When Data Entered)

REPORT DOCUMENTATION PAGE	READ INSTRUCTIONS BEFORE COMPLETING FORM
1. REPORT NUMBER: DRXTH-ES-IA-82316B	2. GOVT ACCESSION NO. / 3. RECIPIENT'S CATALOG NUMBER
4. TITLE (and Subtitle): Installation Assessment of the U.S. Army Garrison, Fort Pickett, Blackstone, Va.	5. TYPE OF REPORT & PERIOD COVERED: Final
	6. PERFORMING ORG. REPORT NUMBER: 316B
7. AUTHOR(s): B.N. McMaster, C.D. Hendry, E.E. Frey, R. Hart, J.B. Holly, C.F. Jones, C.D. Pollman, and K.A. Civitarese	8. CONTRACT OR GRANT NUMBER(s): DAAK11-81-Q-0137
9. PERFORMING ORGANIZATION NAME AND ADDRESS: Environmental Science and Engineering, Inc. P.O. Box ESE Gainesville, Fla. 32602	10. PROGRAM ELEMENT, PROJECT, TASK AREA & WORK UNIT NUMBERS: N/A
11. CONTROLLING OFFICE NAME AND ADDRESS: Commander U.S. Army Quartermaster Center and Fort Lee Fort Lee, Va. 23801	12. REPORT DATE: April 1982 / 13. NUMBER OF PAGES: 153
14. MONITORING AGENCY NAME & ADDRESS (if different from Controlling Office): U.S. Army Toxic and Hazardous Materials Agency Assessment Division Aberdeen Proving Ground, Md. 21010	15. SECURITY CLASS. (of this report): Unclassified / 15a. DECLASSIFICATION/DOWNGRADING SCHEDULE

16. DISTRIBUTION STATEMENT (of this Report)

Distribution limited to U.S. Government Agencies only for protection of privileged information evaluating another command: April 1982. Other requests for this document must be referred to: Commander, U.S. Army Quartermaster Center and Fort Lee, Fort Lee, Va. 23801

17. DISTRIBUTION STATEMENT (of the abstract entered in Block 20, if different from Report)

N/A

18. SUPPLEMENTARY NOTES

N/A

19. KEY WORDS (Continue on reverse side if necessary and identify by block number)

20. ABSTRACT (Continue on reverse side if necessary and identify by block number)

An onsite installation assessment was conducted on Nov. 4-6, 1981, at the U.S. Army Garrison, Fort Pickett (FTP), Blackstone, Va., to determine the presence of any toxic or hazardous materials and to assess the potential for offpost migration. Based on the findings of this assessment, a field survey was not recommended.

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U.S. ARMY GARRISON, FORT PICKETT
SUMMARY

An onsite installation assessment was conducted at the U.S. Army Garrison, Fort Pickett (FTP), Blackstone, Va., to assess past and current use of toxic and hazardous materials, as well as the potential for these substances to migrate off the installation.

The initial installation assessment identified the following sources of potential contamination:

1. Paint residues containing lead, a toxic substance, in the soil near Bldg. 126;
2. Pesticide storage;
3. Polychlorinated biphenyl (PCB) storage;
4. PCBs in the soil near Bldg. 1082 and potentially in the soil near Bldg. 4072; and
5. Petroleum, oil, and lubricants (POL) in the soil near Tank 1558.

An additional problem noted was the violation by three wash racks of Federal regulations prohibiting unpermitted discharges to surface waters.

Available geological evidence and information on contaminant sources do not indicate offpost migration of contaminants via surface or subsurface waters; therefore, a follow-up survey by the U.S. Army Toxic and Hazardous Materials Agency (USATHAMA) is not recommended. However, the following actions by FTP are recommended:

1. Subject the paint-contaminated soils near Bldg. 126 to the extractive procedure (EP) toxicity test for lead and take appropriate action*;
2. Properly store pesticides in Bldg. 240;
3. Properly store out-of-service PCB-containing transformers*;

4. Continue to coordinate with the Defense Property Disposal Office (DPDO) to expedite the physical acceptance of PCB-containing transformers, and, in the interim, maintain out-of-service PCB-containing transformers in accordance with Federal regulations;
5. Continue the current program to clean up PCB-contaminated soils near Bldg. 1082*;
6. Determine if soils near Bldg. 4072 are contaminated with PCBs and take appropriate action*;
7. Clean up POL-contaminated soils near Tank No. 1558 and take appropriate measures to prevent POL spillage at the POL transfer point;
8. Bring the wash racks located in the Mobilization and Training Equipment Site (MATES) area near Bldgs. 135 and 127 and one at Direct Support/General Support (DS/GS) (Bldg. 1556) into compliance with Federal regulations prohibiting unpermitted industrial discharges to surface waters; and
9. Continue efforts to ensure that trihalomethane (THM) levels in the potable water meet Federal standards*.

*Subsequent to the onsite visit, the following actions have been reported by FTP (keyed to Recommendations):

1. Soil samples were collected on May 27, 1982, and arrangements have been made for the U.S. Army Environmental Hygiene Agency (USAEHA) to perform lead analyses;
3. On Jan. 14, 1982, all transformers which had been determined to contain PCB-contaminated fluid were removed for disposal by a commercial contractor, American Electric Corp. Testing of out-of-service transformers has been completed, and disposal of the remaining 21 PCB-contaminated transformers is scheduled for completion during July 15 through Oct. 15, 1982;
5. Follow-up sampling to determine the extent of PCB contamination has been accomplished. This evaluation included analysis of the top 10 centimeters (cm) of soil at three locations having

greatest visible evidence of spillage of transformer fluid. Sample analyses were performed by USAEHA. Test results showed that the PCB level at each sample location was less than 250 parts per million (ppm). Additionally, the spill area has been covered with a 5-cm layer of clay soil sealing the area and preventing contact with humans or animals;

6. On May 28, 1982, soil samples were taken at the base of the transformer pole at Bldg. 4072, and arrangements have been made for USAEHA to perform PCB analyses; and

9. The U.S. Army Training and Doctrine Command (TRADOC) has recommended that FTP not program for plant modifications to reduce THM levels or pursue further studies.

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1.0 GENERAL

1.1 PURPOSE OF THE ASSESSMENT

To determine the existence of toxic and hazardous materials and related contamination at the U.S. Army Garrison, Fort Pickett (FTP), Va., emphasizing those substances posing a potential for migration off the installation.

1.2 AUTHORITY

U.S. Army Materiel Development and Readiness Command (DARCOM) Regulation 10-30, Mission and Major Functions of the U.S. Army Toxic and Hazardous Materials Agency (USATHAMA), July 30, 1981.

1.3 INTRODUCTION

1. In response to a letter from the Commander, USATHAMA, requesting the identification of potentially contaminated installations, the Commander, U.S. Army Training and Doctrine Command (TRADOC), recommended that FTP be included in the Installation Restoration Program.
2. Presurvey instructions were forwarded to FTP by letter to outline assessment scope, provide guidelines to FTP personnel, and obtain advance information for review by the Initial Installation Assessment (IIA) Team.
3. FTP personnel were briefed by a USATHAMA representative on the Installation Restoration Program on Nov. 2, 1981, prior to the onsite records search.
4. Various Government agencies were contacted for documents pertinent to the records search effort. Agencies contacted include:
   a. Department of Defense Explosives Safety Board (DDESB).
   b. U.S. Army Environmental Hygiene Agency (USAEHA).
   c. U.S. Geological Survey (USGS).
   d. Commonwealth of Virginia, Commission of Game and Inland Fisheries.

e. U.S. Army Engineer Topographic Laboratories (USAETL).

f. Washington National Records Center (Suitland).

g. Virginia Geological Survey.

h. U.S. Soil Conservation Service (USSCS).

i. National Archives and Records Service (Navy and Old Army Branch; Modern Military branch).

j. U.S. Environmental Protection Agency (EPA) Environmental Photographic Interpretation Center (EPIC), Vint Hill Farms Station, Warrenton, Va.

k. EPA Storage and Retrieval (STORET) Water Quality Data Base.

5. The onsite phase of the records search was conducted Nov. 4-6, 1981. The information presented in this report is current, as of the date of the onsite search. The following personnel from ESE, under Contract No. DAAK11-81-C-0093, were assigned to the team:

   . Mr. Charles Hendry, Team Leader
   . Mr. Ernest Frey, Engineer
   . Dr. Robin Hart, Ecologist
   . Mr. James Holly, Hydrogeologist
   . Ms. Carla Jones, Historian
   . Mr. Curt Pollman, Chemist

6. In addition to the records review, interviews were conducted with former and current employees. A ground tour of the installation was made and photographs were taken.

7. Only those directorates, tenants, and activities potentially involved in the handling, production, testing, and disposal of contaminants were investigated.

1.4 CURRENT INSTALLATION ORGANIZATION

FTP is a semiactive subinstallation of the U.S. Army Quartermaster Center and Fort Lee (QMCENFL, herein referred to as FTL) under the command of TRADOC. Certain mission assignments and some funding are provided by the U.S. Army Forces Command (FORSCOM). The overall mission of FTP is as follows: to provide administrative and logistical support, maneuver and training areas (including live fire tank and artillery

ranges) for Reserve Components, units of the Active Army, and other military services; to furnish security, financial, legal, logistical, medical, dental, welfare, intelligence, religious and moral services, and facilities; to provide facilities engineering services to satellite units in Virginia; to operate the FTP recreation program and manage fish, wildlife, and woodlands onpost; to provide water treatment plant (WTP) and sewage treatment plant (STP) services to the Town of Blackstone.

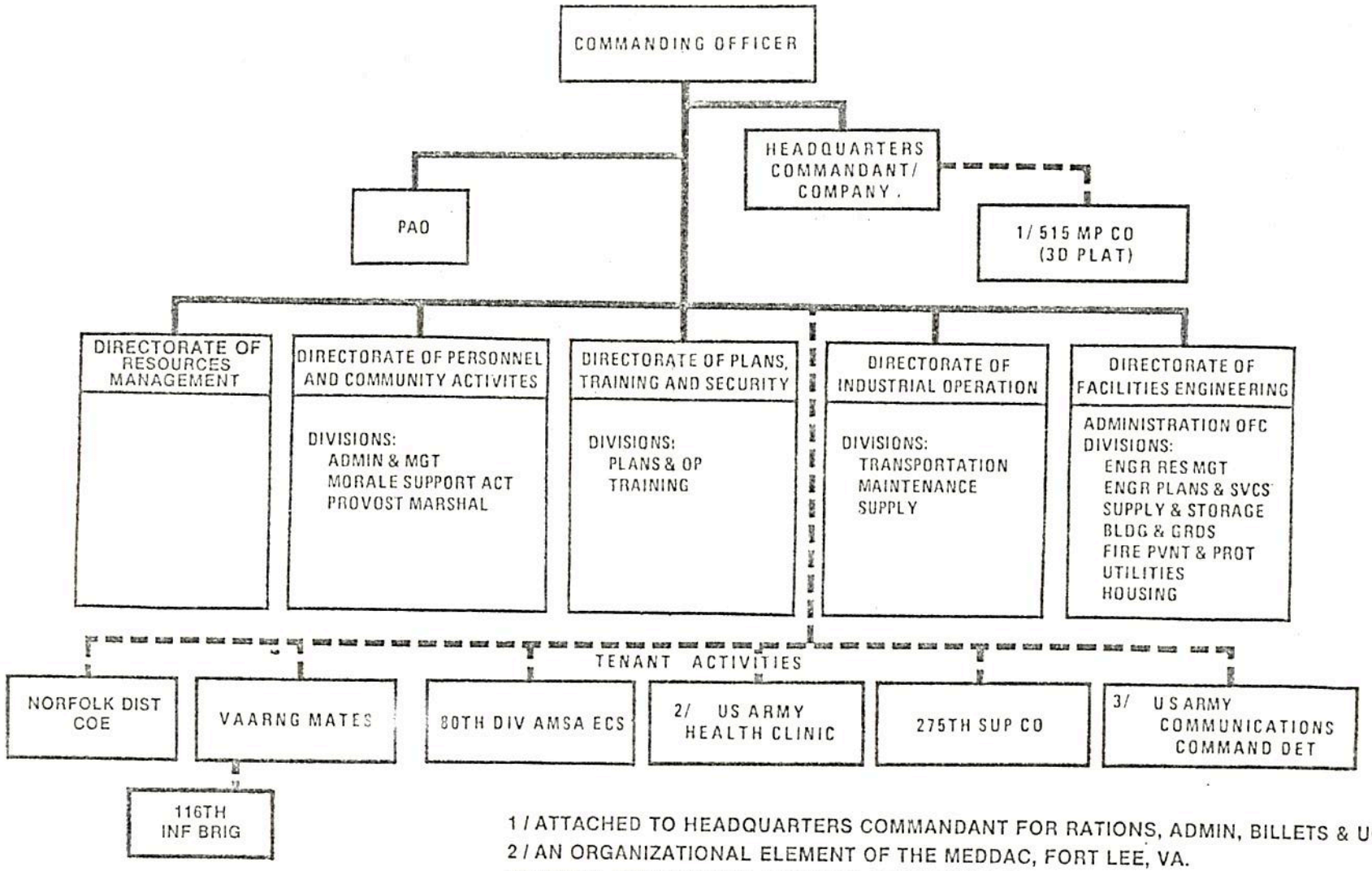
1.4.1 DIRECTORATES

Fig. 1.4-1 illustrates the organizational structure of FTP. As shown, four directorates support the Post Commander. These are listed below, followed by brief mission statements. Prior to January 1981, no directorates were in existence on FTP, and the functions described below for the current directorates were performed on the division level.

1. Directorate of Personnel and Community Activities (DPCA): responsible for personnel and community activities, including the Army Safety Program and physical security onpost, and advises the Post Commander on management aspects of administrative activities.

2. Directorate of Plans, Training, and Security (DPTSEC): supervises training, operation, and safety of training areas and ranges onpost, as well as the post Nuclear, Biological, Chemical (NBC) School.

3. Directorate of Industrial Operations (DIO): provides logistical support to activities on FTP; coordinates troop issue, commissary, purchasing and contracting, food services, etc.; responsible for fuel supply and storage; performs equipment maintenance and repair; inspects shops and motor pools; controls traffic and transportation; and controls and secures stock in storage.



1 / ATTACHED TO HEADQUARTERS COMMANDANT FOR RATIONS, ADMIN, BILLETS & UCMJ.
2 / AN ORGANIZATIONAL ELEMENT OF THE MEDDAC, FORT LEE, VA.
3 / UNDER OPERATIONAL CONTROL OF CO-ALSO SERVES AS INSTALLATION C-E OFFICER.
= = = TENANT ACTIVITY

SOURCE: FTL, 1981.

Figure 1.4-1
ORGANIZATIONAL CHART OF FORT PICKETT

Prepared for:
U.S. Army Toxic and Hazardous Materials Agency
Aberdeen Proving Ground, Maryland

4. Directorate of Facilities Engineering (DFAE): maintains and repairs real property; provides pollution control and pest control services, sanitation, and refuse disposal; and operates a rock quarry to provide crushed stone and paving mix for the post (FTL, 1981).

Among these directorates, only DPTSEC, DIO, and DFAE are involved with toxic and hazardous materials and will be discussed further in Sec. 2.

1.4.2 TENANT ACTIVITIES

As illustrated by Fig. 1.4-1, eight tenants are currently active on FTP. Only five of these are involved with toxic/hazardous materials. A brief mission statement for each follows:

1. 116th Separate Infantry Brigade--Virginia Army National Guard (VaARNG): Arrived on FTP on Dec. 1, 1980, this tenant occupies Bldg. 124 under an Interservice Support Agreement (ISSA) and provides logistical support to the 116th, including training in automatic data processing.

2. U.S. Army Health Clinic: This clinic has been in Bldg. 408 for 30 years and currently maintains a dental office and X-ray machine. Personnel are provided by the Kenner Army Hospital on FTL.

3. 275th Supply Company [U.S. Army Reserve Center (USARC)]: Onpost since 1972, this activity receives and processes for storage, maintains for storage, and deprocesses for issue, 2,200 tanks, fighting vehicles, artillery, and special engineering equipment (e.g., rock crusher-corer) and maintains two shops operated by the 301st Signal Company.

4. 80th Division Area Maintenance Support Activity/Equipment Concentration Site (AMSA/ECS 88): Onpost for 17 years, this activity serves as the post AMSA/ECS. Prior to February 1977, it was the 97th U.S. Army Reserve Command (ARCOM) instead of the 80th Division.

5. Mobilization and Training Equipment Site (MATES): Established Feb. 1, 1961, MATES provides support maintenance on Army National Guard and U.S. Army Reserve (USAR) equipment on FTP (tanks, howitzers, mortar carriers, personnel carriers, cargo carriers, combat engineer vehicles, command post vehicles, armored vehicle launched bridge and recovery vehicles); tactical wheeled vehicles (trucks of various tonnage, trailers, cranes, and forklifts); and administrative use vehicles (cars, ambulances, buses, etc.).

Activities of environmental interest conducted by these tenants are discussed in Sec. 2.

1.5 INSTALLATION HISTORY

1.5.1 GENERAL HISTORY

In 1941, more than 18,000 hectares (ha) of land in four counties were purchased to establish a training camp for World War II troops. Construction was completed in July 1942, and Camp Pickett, named for Civil War General George Pickett, was dedicated. During World War II, Camp Pickett provided advanced infantry and amphibious training to troops prior to their overseas deployment, and at its peak in 1943, 85,000 troops were stationed there. Camp Pickett also served as a base for airborne operations and as a detention area for German prisoners of war (POWs). In 1942, the Medical Replacement Training Center moved to Camp Pickett from Camp Lee.

In the years following the war, activity at Camp Pickett slowed considerably. Between 1946 and 1949, Camp Pickett was opened and closed twice. In 1950, however, the need for troops to fight in Korea resulted in the reactivation of Camp Pickett. Following the war, Camp Pickett was once again inactivated, a status which it retained from 1954 until July 1973, when it received its current designation as semiactive.

In 1963, Camp Pickett became a subordinate installation of FTL, its primary mission to provide artillery and armor training to units of the Active Army, Reserves, Navy, National Guard, and Air Force. In 1974, Camp Pickett was redesignated Fort Pickett but has retained its semiactive status to the present (FTP, n.d., FTP, 1981b).

1.5.2 ARCHAEOLOGICALLY AND HISTORICALLY SIGNIFICANT AREAS

Few areas of historical preservation have survived on FTP, although the area it occupies was settled by American Indians and later by English colonists who established farms and grist mills. Periodic excavations onpost uncover arrowheads and artifacts from the Indian occupation, and the locations of grist mills can be established by examining maps of the period.

Several farmhouses and cemeteries are maintained onbase but are not of great historical significance. The Officer's Club onpost contains a wall mural reportedly painted by a German POW held at Camp Pickett during World War II.

A detailed account of historical properties on FTP appears in the "Historical Survey of Fort Pickett," available from the Protocol Office (FTP Protocol Office, n.d.; FTP, 1974).

1.6 ENVIRONMENTAL SETTING

1.6.1 LOCATION

FTP is located in the southern Piedmont section of the Commonwealth of Virginia, approximately 5 kilometers (km) east of the Town of Blackstone (Fig. 1.6-1). The installation occupies areas of Nottoway, Brunswick, Dinwiddie, and Lenenburg Counties. The total area of FTP is 18,299 ha: 10,563 ha of commercial forest land, 366 ha of improved grounds, 960 ha of semi-improved grounds, and approximately 6,410 ha of unimproved grounds, which include 222 ha of freshwater lakes and ponds. FTP provides logistical and engineering support to 12 offpost USARCs, which contain 10 ha of improved grounds, 115 ha of semi-improved

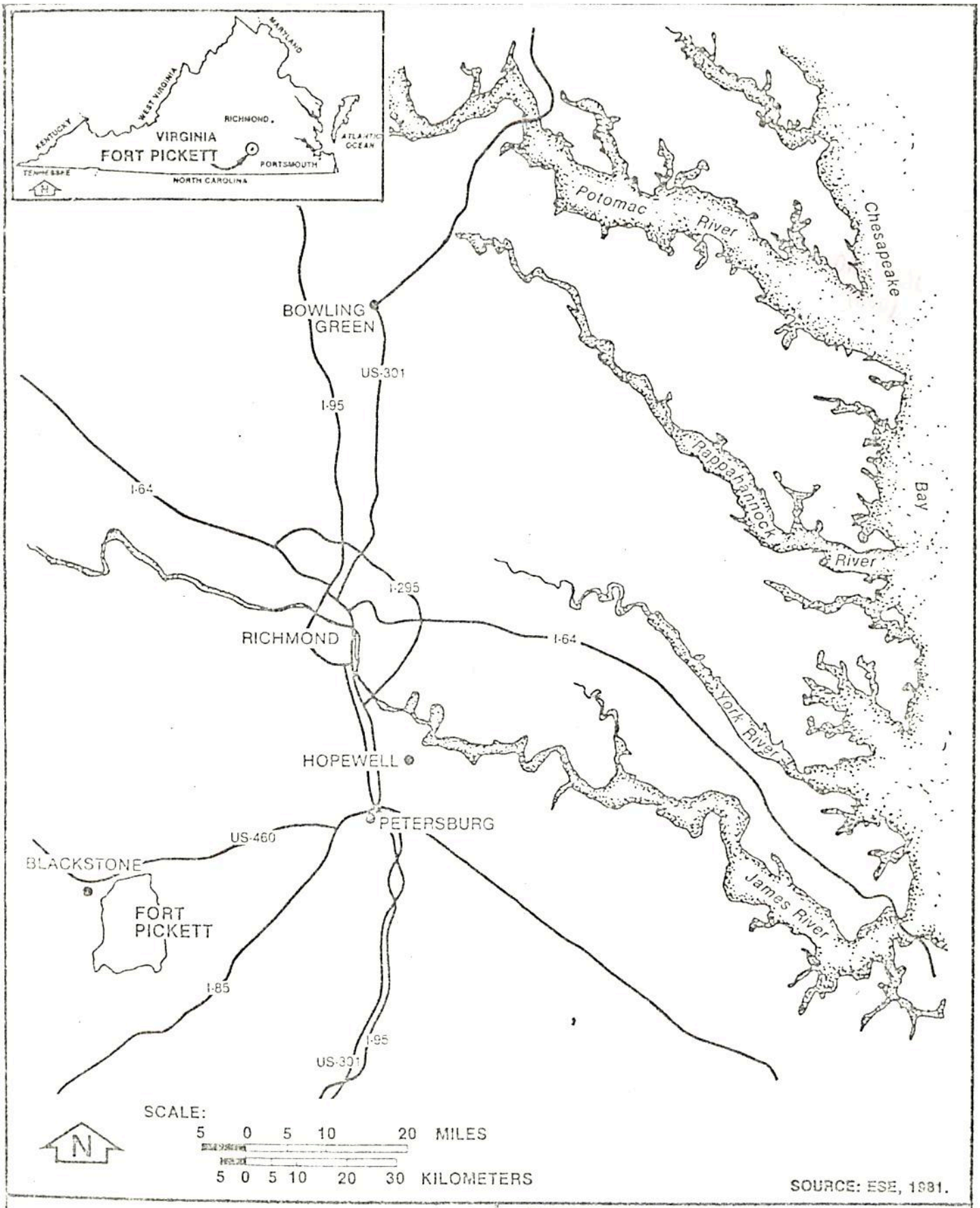


Figure 1.6-1
LOCATION MAP OF FORT PICKETT AND VICINITY

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grounds, and 43 ha of unimproved grounds for a total area of 168 ha (FTP DFAE, 1981c).

Highways serving FTP include State Highway 46, which is adjacent to the southwest boundary; U.S. Highway 460, which borders the northern boundary; and State Highway 40, which crosses the northern section of the installation. The Norfolk and Western Railroad is located just north of the installation boundary. The Nottoway River, which is not navigable, bisects the southern section of the installation.

FTP lies in a rural area of Virginia consisting of pasture and cropland. South Hill, a community with a population greater than 3,500, is located within 50 km of the southern boundary of the installation.

Approximately 459 ha of property in the northwest corner of FTP have been leased to Virginia Polytechnic Institute (VPI) since 1972 (see Sec. 1.7) for use as a multi-purpose agricultural research station (FTP DFAE, 1981c).

1.6.2 METEOROLOGY

Annual precipitation at Blackstone, Va., averages 107 centimeters (cm) (FTP DFAE, 1981c). Rainfall is distributed fairly evenly throughout the year but tends to be highest in July. Snowfall averages 39 cm and falls between November and March; the heaviest snowfall is recorded in January.

The annual mean temperature is 13 degrees Celsius (°C). The maximum monthly mean temperature (25.5°C) is in July, and January records the minimum monthly low temperature of 3.5°C. Average monthly temperatures and precipitation for a 30-year period (1941-70) are given in Table 1.6-1.

Prevailing winds are from the south-southeast, with an annual average wind velocity of 0.4 meters per second (m/sec) (USAEHA, 1974).

Table 1.6-1. Monthly and Annual Temperatures and Precipitation at Blackstone, Va.*

Month	Temperature (°C)	Average Precipitation (cm)
January	3.5	7.21
February	4.5	8.46
March	8.6	8.92
April	14.5	7.98
May	19.3	8.89
June	23.5	9.25
July	25.4	13.82
August	24.6	10.31
September	21.1	9.22
October	15.3	7.09
November	9.6	7.62
December	4.3	7.98
Annual	14.5	106.73

*Period of record is 1941-70.

Source: Modified from FTP, 1974.

1.6.3 GEOGRAPHY

Physiography

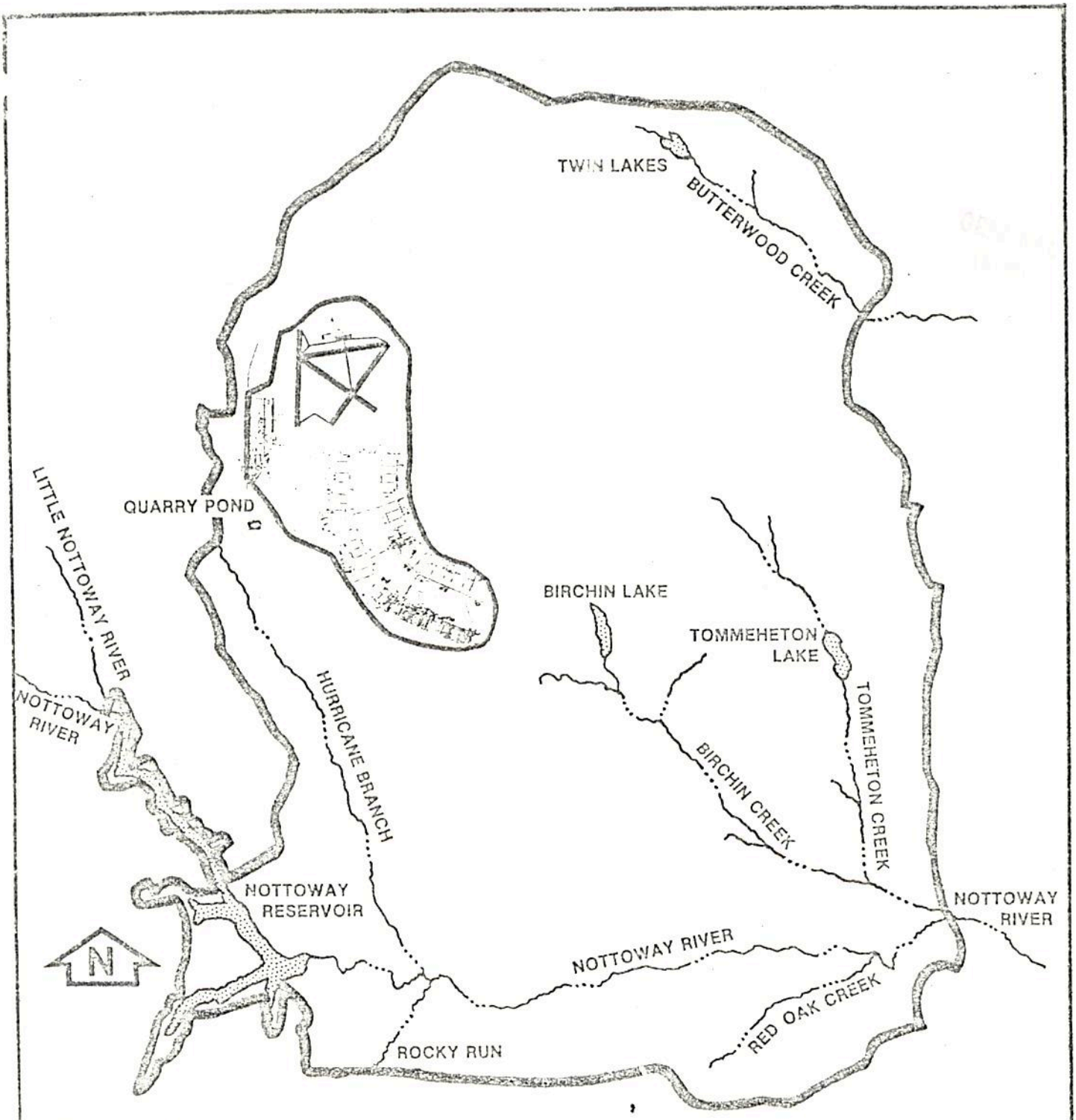
The area around FTP is characterized as a plain which has been deeply dissected by numerous small streams that follow narrow winding valleys. Many of the larger streams, especially in the southern part of the installation, have cut deep V-shaped valleys with steep, narrow sides, with slopes estimated to range up to 50 percent in the steeper stream valleys. In the northern part of the installation, the land surface is gently undulating to nearly level ridgetops where the streams have not cut back into the ridges. Slopes in these areas are estimated to be generally less than 15 percent.

Elevations on the installation range from about 60 meters (m) near the Nottoway River to 130 m in the north-central area.

Surface Hydrology

The major surface water feature at FTP is the Nottoway River, which crosses the southern part of the installation from west to east. About 90 percent of the installation belongs to the Nottoway River drainage basin, which consists of six small tributaries flowing into the Nottoway River (Fig. 1.6-2). The northeast corner of the installation forms part of the drainage basin for Butterwood Creek, which flows across the reservation from northwest to southeast.

Approximately 222 ha of freshwater lakes and ponds exist on FTP. Eleven lakes and ponds, totaling 210 ha, are currently being managed for game fish (see Sec. 1.6.5). All of the lakes and ponds appear to be manmade impoundments across stream channels. The Nottoway River has been dammed on the western edge of the installation, forming the Nottoway Reservoir, which FTP uses as a drinking water source. Table 1.6-2 lists the largest lakes and ponds on the installation, and Fig. 1.6-2 shows the locations of the water bodies.



NOTE: REFER TO TABLE 1.6-2 FOR FURTHER INFORMATION ON SELECTED WATER BODIES SOURCE: ESE, 1981.

Figure 1.6-2
MAJOR SURFACE WATER FEATURES
ON FORT PICKETT

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Aberdeen Proving Ground, Maryland

Table 1.6-2. Major Surface Impoundments on FTP

Lake/Pond (see Fig. 1.6-2)	Surface Area (ha)	Watershed Area (ha)
Nottoway Reservoir	156	52,229
Tommeheton Lake	26	4,569
Birchin Lake	19	1,592
Twin Lakes	8	1,244
Wonju Lake	1	18
Quarry Pond	0.5	10
Reservation Pond	0.5	8

Source: FTP, 1974.

1.6.4 GEOHYDROLOGY

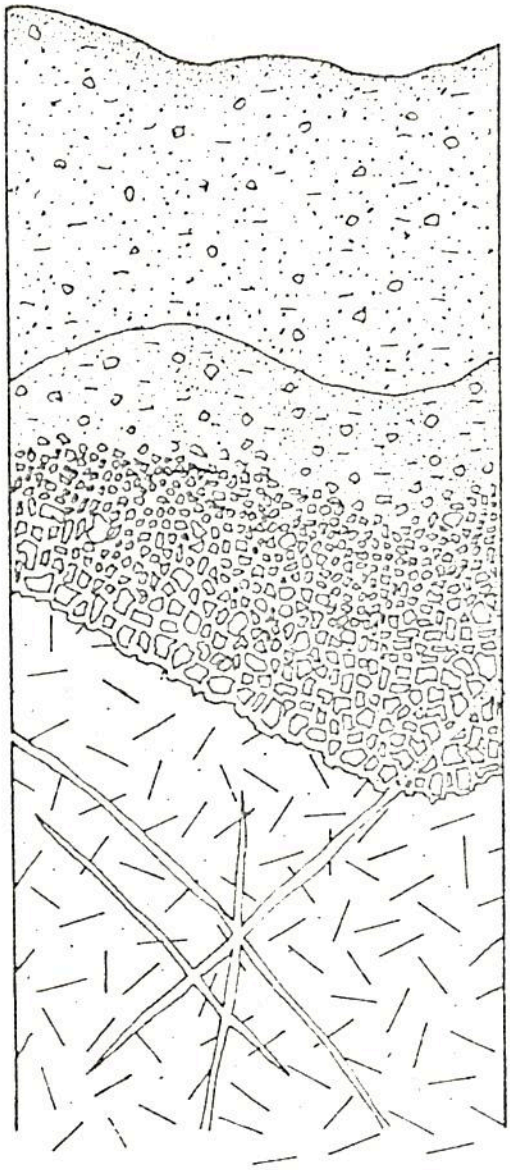
Geologic Setting

The Commonwealth of Virginia is divided into five major physiographic provinces. From west to east, these are: (1) the Cumberland Plateau, consisting of flat-lying Paleozoic rocks; (2) the Valley and Ridge, a series of fault blocks consisting of Paleozoic sedimentary rocks; (3) the Blue Ridge, consisting of a complex sequence of Cambrian and Precambrian sedimentary rocks and Precambrian igneous and metamorphic rocks; (4) the Piedmont, of which FTP is a part, consisting of older Precambrian gneiss, schist, and granite; and (5) the Coastal Plain, consisting of a wedge of generally unconsolidated sediments which dip and thicken to the east.

FTP is located about 16 km west of the fall line, the boundary between the Piedmont and the Coastal Plain. The rock underlying the installation consists of Petersburg granite to the east and metamorphic rocks (gneiss and schist) of undetermined age to the west. The surface of the rock is highly irregular due to intense weathering. The rock appears at land surface in some areas and may be in excess of 15 m below land surface in other areas. Foundation borings at the installation reveal that depth to the rock surface may vary by 10 m within a single building site. Gravel, sand, silt, and clay cover the rock surface. The sediment cover is, for the most part, the end product of rock decomposition. In some areas, a layer of saprolite (rock that has decomposed in place) exists between the rock and the sediment cover. The saprolite exists as various products of rock decomposition, ranging from rock fragments to clay. The saprolite thickness is highly variable. Saprolite is not always distinguishable from the sediment. Fig. 1.6-3 is a generalized geologic column of the installation.

Soils

The soils report for Nottoway County indicates that four major soil associations dominate the installation (USSCS, 1960).



SEDIMENT COVER — 0 to 15 meters thick; composed of gravel, sand, and clay; variable permeability, generally moderate but may develop zones of high permeability in sand lenses.

SAPROLITE — 0 to 15 meters thick; composed of decomposed metamorphic and igneous rock; variable lithology, *i.e.*, rock fragments, sand, clay; variable permeability—zones with a high percentage of rock fragments may exhibit high permeability, while clay areas have low permeability; usually grades into and may be indistinguishable from the overlying sediment but may grade into the underlying bedrock.

BEDROCK — composed of granite, gneiss, and schist; rock is generally impermeable, but low secondary permeability may develop as cracks in the rock.

SOURCE: ESE, 1981.

Figure 1.6-3
GENERALIZED GEOLOGIC COLUMN FOR THE FORT PICKETT AREA

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The Appling-Cecil-Durham Association covers more than 50 percent of the area. It is described as a deep, well-drained, mostly undulating soil overlying granite and granite-gneiss. Permeability for the majority of the soils in this association is moderate.

Soils of the Appling-Louisburg-Cecil Association are described as deep, well-drained to shallow, excessively drained, undulating to rolling soils that overlie granite, granite-gneiss, or pegmatite. Permeability of the majority of this association is moderate.

Soils of the Appling-Durham-Louisburg Association are described as dominantly deep, well-drained, undulating to rolling soils that overlie granite and granite-gneiss. Permeability is characterized as moderate.

Durham-Appling-Worsham Association soils are predominately deep, well-drained to moderately well-drained, nearly level soils that overlie granite or granite-gneiss. The permeability is characterized as moderate.

In general, soils over FTP are similar, except for variations in topography and depth to bedrock.

Ground Water

The groundwater system at FTP probably exists as a multiaquifer system, with producing zones or aquifers existing in local lenses of sand or gravel, saprolite, or in rock fractures. These producing zones are separated both laterally and vertically by impermeable sediments or unfractured rock. The original rock texture is generally impermeable. Ground water in this type of area is produced from three major sources: (1) permeable zones of sand or gravel within the sediments; (2) broken rock, gravel, or sand within the saprolite zone; or (3) fractures within the rock. Where present, the saprolite zone is usually the most productive of these sources.

The general direction of groundwater flow is probably toward low areas, where it discharges to streams. Although unlikely, regional recharge is directly the result of rainfall at the site. As indicated by foundation borings, water levels range from 1.7 to 10 m below land surface.

Wells

Three wells are reportedly located on FTP. These are used as potable water supply for individual residences. No data are available on well construction; all three were installed prior to 1941. Reportedly, several dug wells were located on the installation in the past, but these have been filled. The actual number was not known.

1.6.5 BIOTA

Vegetation

Natural vegetation on FTP consists of pine and hardwood forest. Six major forest types occur on the reservation: natural pine, pine-hardwood, upland hardwood, bottomland hardwood, cove hardwood, and swamp hardwood (FTP DFAE, 1977).

1. Natural Pine. This type of forest occurs on upper slopes, ridges, and abandoned fields. More than 80 percent of the trees are pine. Loblolly pine (Pinus taeda) is the most common pine in pure and mixed stands; however, shortleaf pine (Pinus taeda) and Virginia pine (Pinus virginiana) also occur in this forest type.
2. Pine-Hardwood. Hardwoods in this vegetation type constitute 20 percent to 80 percent of the overstory. Pines are commonly mixed with upland hardwoods on upper and lower slopes, and also with bottomland hardwoods on lower slopes and bottomland areas.
3. Upland Hardwood. Mixed oaks (Quercus spp.), hickory species (Carya spp.), and American beech (Fagus grandifolia) comprise 80 percent of the overstory trees in this vegetation type. Upland hardwoods are usually located in the middle and lower slopes.

4. Bottomland Hardwood. A minimum of 80 percent of the overstory trees consist of bottomland hardwoods, such as red maple (Acer rubrum), sweet gum (Liquidambar styraciflua), sycamore (Platanus occidentalis), river birch (Betula nigra), willow oak (Quercus phellos), white ash (Fraxinus americana), and occasionally black gum (Nyssa sylvatica) and elm (Ulmus americana). This vegetation type is located in small drainages, swamps, and poorly drained soils bordering streams.
5. Cove Hardwood. This type differs from the bottomland hardwood type by the presence of sufficient numbers of yellow poplar (Liriodendron tulipifera) trees, which would reseed the area if other species were removed. Yellow poplar trees are the most economically valuable hardwood on the installation. Cove hardwoods occur in well-drained soils in small drainage areas. Red maple, sweet gum, and occasionally black walnut (Juglans nigra) are also found in these areas.
6. Swamp Hardwood. Swamp hardwood is similar to bottomland hardwood, but red maple and sweet gum are the most abundant species on FTP. It is more likely to be found in poorly drained areas than on drainages and streambanks.

Other vegetation types found on the installation occur in marsh and open ruderal areas. App. A, Table A-1, shows the areal extent and the military use of each vegetation type, and Table A-2 lists the common woody and herbaceous plants which occur on FTP.

Woodland management on FTP consists of an even-aged management system for loblolly pine and yellow poplar, which are cut on a 5-year cycle. Selective harvesting of mature timber is conducted on mixed-species sites. Trees in the impact area are impregnated with metal and have little economic value.

Ongoing research at FTP includes a study of bark-beetle-infested timber by VPI. Forestry classes from VPI and Virginia State University, as

well as local school groups, visit the installation to study the natural areas.

Open areas of the base are seeded with Kentucky 31 fescue and lespedeza to provide ground cover. Many of the herbaceous plants listed in App. A, Table A-2, grow naturally on these areas.

The use of chemicals to control weeds is minimal; however, a much greater use of herbicides is planned in the future on railroad rights-of-way, security fences, utility poles, and other areas difficult to mow. Herbicides used will include pramitol, diuron, and Round-Up®.

Wildlife

Common mammal and bird species which occur on FTP are listed in App. A, Table A-3. Of the wildlife species under management, rabbit and turkey populations have been declining since the 1960s when expansion of ranges and training areas was initiated. The reduction in turkeys can be attributed to the loss of suitable habitat, but the decline in rabbit populations is not understood. Research is being conducted to determine the cause. The increase in open habitat has favored quail reproduction.

The deer population ranges from 1,500 to 2,000 animals. In 1980, approximately 500 to 1,000 deer reportedly died of epizoologic hemorrhagic disease. Overcrowding in the controlled access area where hunting is not permitted was reported to be a factor in the deaths.

In addition to the wildlife species listed in the appendix, snakes (including copperheads), lizards, salamanders, turtles, and frogs also occur onbase.

Aquatic Species

Approximately 222 ha of freshwater lakes and ponds exist on FTP, of which 11 lakes and ponds, totaling 210 ha in area and ranging in size from 0.4 ha to 156 ha, are managed for game fish. Weeds are controlled chemically in some ponds, diquat being the only herbicide used.

Fish species under management are listed in App. A, Table A-4. Freshwater shad are reported to be subject to fish kills in the spring; however, the cause of this phenomenon is not known.

Threatened and Endangered Species

The Federal Endangered Species Act of 1973 [Public Law (P.L.) 93-205] charges the U.S. Fish and Wildlife Service (FWS) with the protection of Federally listed threatened and endangered plant and animal species. FWS published a list of threatened and endangered species on May 20, 1980 (FWS, 1980). This list identifies protected species as occurring or potentially occurring in the region of central Virginia. No plant species on the Federal list are likely to occur in the FTP area. No known Federally listed threatened or endangered plant or animal species reside on FTP. Federally protected species in Virginia are listed in App. A, Table A-5.

1.7 LEASES AND AGREEMENTS

A variety of easements are in effect on FTP, including rights-of-way for a public road, an irrigation waterline, and overhead and underground telephone cables, as well as perpetual access over 1.3 ha of land held by two private citizens for sewer lines.

Licenses are held by the Central Telephone Co. of Charlottesville, Va., for overhead and underground telephone cables and VaARNG for 16.8 ha of land as a year-round training area.

Since 1972, VPI has leased 458.5 ha of land on FTP for the operation of an agricultural research center. The Town of Blackstone has leased 109 ha of land on FTP since 1967 for the operation of a municipal airport.

FTL has supplied the Town of Blackstone with potable water and sewage treatment services since the 1940s. Copies of the original and current

contracts covering these services are contained in App. B. These operations are further discussed in Sec. 2.0.

Since 1979, the Federal Aviation Administration (FAA) has used approximately 20 ha of land and one building on FTP for administrative purposes under a permit.

Finally, the Town of Blackstone provides fire protection for FTP under an agreement which has been in effect since 1952.

1.8 LEGAL CLAIMS

There are no records of injuries or deaths among civilian employees onbase; however, several fatalities among military personnel were reported to have occurred. One incident involved a jeep accident and the other the accidental shooting of a member of the 82nd Airborne during a demonstration of a .50-caliber (cal) machinegun in 1979. None of these incidents resulted in legal action.

A resident on the eastern boundary of the base periodically complains that his hogs are disturbed by artillery fire from nearby ranges. No legal action has been taken.

In 1977, FTP did become involved in a law suit. Reportedly, a local teenager removed a 40-millimeter (mm) grenade from one of the ranges on FTP and brought it to shop class at the Huguenot Academy, a local private high school. Thinking the grenade to be an inert dud, the boy placed it in a vice and pounded on it with a hammer. The grenade exploded, killing one boy and injuring five others. Although the range area was posted and the grenade was removed without authorization, the Government served as one of five defendants in the ensuing law suit. In 1980, the case was settled out of court, and the Government was required to pay $145,000 in damages. A selection of newspaper clippings concerning this case appears in App. C.

2.0 PAST AND CURRENT ACTIVITY REVIEW

2.1 INSTALLATION OPERATIONS

2.1.1 INDUSTRIAL OPERATIONS

The major industrial operation at FTP is vehicle maintenance. Maintenance operations are performed by the following: (1) Direct Support/General Support (DS/GS) (Bldg. 1556) and the motor pool (Bldg. 318), both of which are operated by DIO; (2) MATES (Bldg. 130), operated by VaARNG; and (3) ECS at Bldg. 564, operated by USAR. Major vehicle repair, such as engine overhaul, battery maintenance, and body work, are performed at the DS/GS and MATES sites. The other two facilities concentrate on daily operational maintenance such as oil changes.

2.1.2 LESSEE INDUSTRIAL OPERATIONS

There are no lessee industrial operations on FTP, and no records were found to indicate that any lessee operations have occurred at FTP in the past.

2.1.3 LABORATORY OPERATIONS

Laboratory operations on FTP include water test laboratories at the WTP and STP, a photographic laboratory, and a health clinic laboratory.

The WTP laboratory (Bldg. 3430) conducts routine operational surveillance of the drinking water both at the WTP and in the distribution system. Analysis consists of coagulation tests, pH, alkalinity, chlorine residuals, turbidity, and coliform tests. Only small quantities of water test reagents are stored and used at the laboratory.

The STP laboratory (Bldg. 2010) conducts routine effluent testing for National Pollutant Discharge Elimination System (NPDES) compliance.

Analyses include pH, suspended solids (SS), 5-day biochemical oxygen demand (BOD_5), chlorine residuals, and dissolved oxygen (DO). As in the case of the WTP laboratory, only small quantities of water test chemicals are stored and used in the operation of this laboratory.

The photographic laboratory is located in Bldg. 1307. Chemicals used in the photographic process include developer and fixer solutions containing sodium thiosulfate, formaldehyde, hydroquinone, acetic acid, and potassium ferrocyanide. During the fixing process, silver is extracted from the photographic emulsion on the film surface. Every 2 months, the fixative solution [100 liters per year (lpy)] is sent to the photographic laboratory at FTL for silver recovery.

The health clinic (Bldg. 408) at FTP performs no chemical analyses. All blood and urine samples are sent to Kenner Army Hospital at FTL for analysis. The clinic processes X-rays and generates developing [20 liters per month (l/month)] and fixing (20 l/month) solutions, which are sent to Kenner Army Hospital at FTL for silver recovery.

2.1.4 MATERIEL PROOF AND SURVEILLANCE TESTING

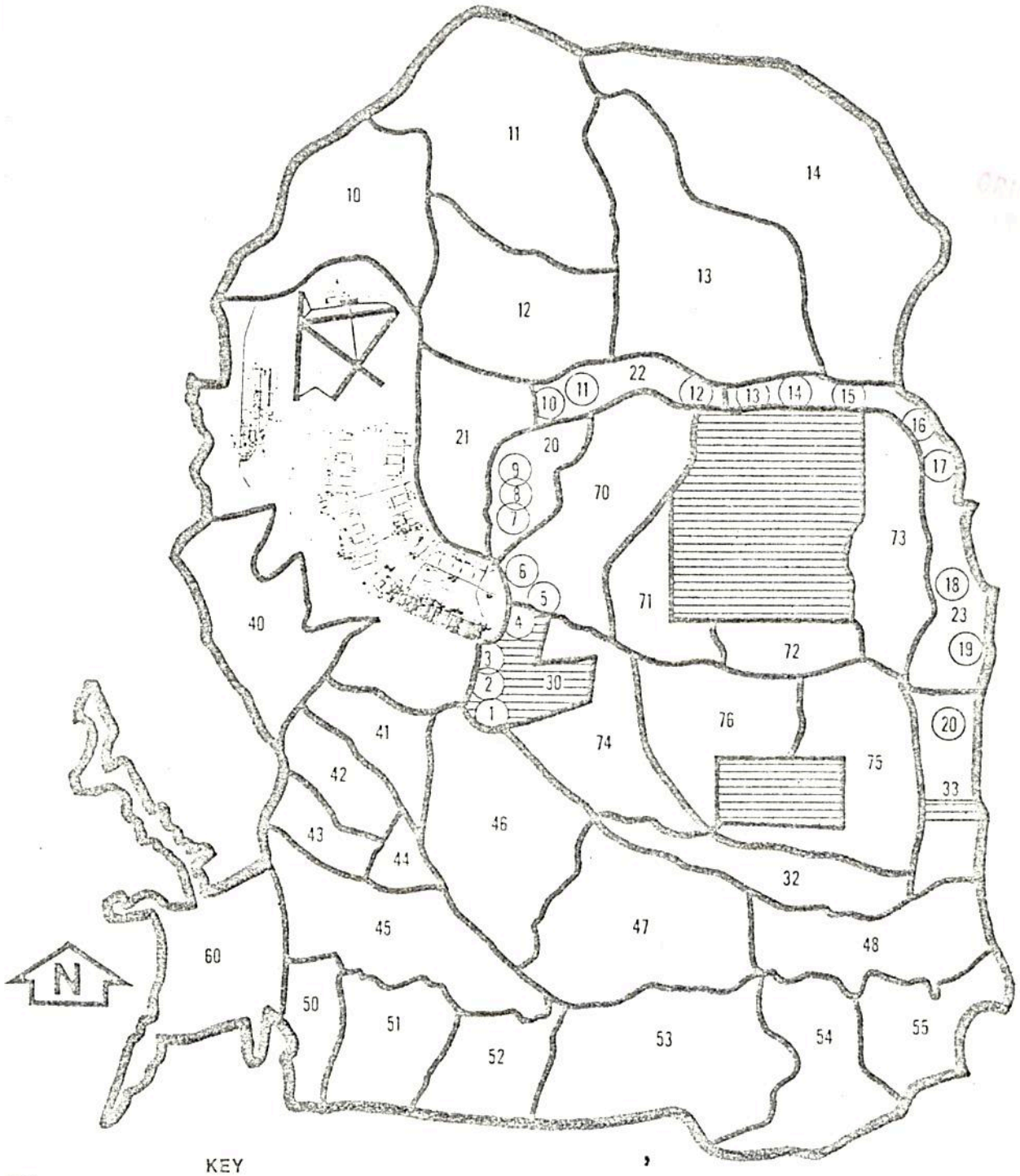
Reportedly, no materiel proof or surveillance testing is conducted at FTP.

2.1.5 TRAINING AREAS AND ACTIVITIES

FTP's mission is to support Reserve and National Guard units for 2-week annual training periods from May to September, and for Multiple Unit Training Assemblies during nonannual training periods (October-April).

Fig. 2.1-1 shows the locations of training areas and ranges on FTP (FTP, 1981a).

Table 2.1-1 lists the training areas and special training exercises which occur at FTP. The only training activities involving toxic and



SOURCES: FTP, 1981a.
ESE, 1981.

Figure 2.1-1
TRAINING AREAS AND RANGES ON FORT PICKETT

Prepared for:
U.S. Army Toxic and Hazardous Materials Agency
Aberdeen Proving Ground, Maryland

Table 2.1-1. Training Areas and Activities on FTP

Area	Training Activity
11, 12, 13, 14	Tank maneuver area; bridge training site in Area 11; small controlled demolitions, using C4 and TNT to destroy trees and create small craters; small pyrotechnics with CS grenades.
4, 5, 42-48, 50-55	Tanks and infantry training; indirect fire points into no-access impact area; small demolitions; no live fire from machineguns, small arms, or tanks.
20, 22, 23, 30, 33	Mortar firing of illumination rounds in Area 33; Blackstone Army Airfield helicopters practice landing procedures and airborne drops.
10	No training; leased to VPI for use as an agricultural research station.
40, 41, 42	Used infrequently for navigation exercises (orienteering).
60	Helicopter landing strip; infrequently used due to proximity of reservoir.
Bldg. 109 (Cantonment Area)	Gas chamber for decontamination training; contaminants simulated with talcum powder.
Cantonment Area (in the planning stage)	An urban warfare training site (simulated village) is planned for 1985 or 1986. Training will incorporate the use of pyrotechnic and riot control devices (smoke and CS).

Source: ESE, 1981.

hazardous materials are those using ordnance and riot control agents (CS). Ordnance is used on designated range areas (see discussion of range activities in Sec. 2.1.6). Riot control training occurs in Bldg. 709 using CS gas. CS training exercises reportedly occur approximately every 2 weeks during the summer. CS containers are stored and issued by the ammunition supply point (ASP). NBC training exercises utilize talcum powder as a simulant. Reportedly, no lethal biological or chemical agents have been used at FTP. The training facilities are utilized by civilians and by various military units. Greatest use is by the National Guard, USAR, and the Marines. Civilians using the training facilities include members of the county police and the Federal Bureau of Investigation (FBI) (FTP, 1981c).

2.1.6 RANGES

FTP has 20 firing ranges, located on the periphery of a central impact area (Fig. 2.1-1). Guarded barriers prevent access to danger areas while firing is being conducted (FTP, 1981a).

The impact area, in use since 1942, is divided into a controlled-access area and a no-access area. The no-access area lies opposite Ranges 1, 2, and 3 because 40-mm ammunition with a high percentage of duds is used on these ranges. Excess powder (Composition B) in bags is burned at the firing points.

Due to the construction of new tank ranges and increased awareness of the facilities at FTP, the ranges had unusually high utilization in 1981.

The weapons systems and associated suitable ranges on FTP are listed in Table 2.1-2. The activities, weapons, and ammunition suitable for each range are listed in Table 2.1-3.

Lethal chemical rounds reportedly have not been used on the ranges. Pyrotechnics used include 105-mm illuminating, 105-mm smoke, and 105-mm

Table 2.1-2. FTP Ranges Suitable for Various Weapons Systems

Weapons Systems	Suitable Ranges *
1. Hand Grenades	1
2. Demolitions	1
3. Claymore Mines	17, 20
4. Pistols	4, 5
5. M16 Rifles	2, 6, 7, 8, 9, 18
6. .30-cal Rifle	2, 6, 7, 8, 9, 18
7. M60 Machineguns	2, 17, 18, 19, 20
8. .45-cal Sub-Machinegun	5, 17, 20
9. .50-cal Machinegun	2, 11, 12, 13, 14, 15, 16, 17, 20
10. M79 Grenade Launchers	3, 17, 18, 20
11. M203 Grenade Launchers	3, 17, 18, 20
12. LAW*	3, 17, 18, 20
13. Dragon Missiles	3, 17, 20
14. TOW† Missiles	Observation Post 3
15. 90-mm and 106-mm Recoilless Rifles	11, 13, 15, 16
16. 105-mm Maingun Tank	11, 13, 15, 16
17. M42 Duster	11, 13, 15, 16
18. 165-mm CEV**	15
19. Helicopter (Gunship)	15
20. 25-lb†† Practice Bombs	Impact Area

* LAW = Light Anti-Tank Weapon.
† TOW = Tube-Launched, Optically-Tracked, Wire-Command Link.
** CEV = Combat Engineer Vehicle.
†† lb = pound.

Source: FTP, 1981a.

Table 2.1-3. Activities, Weapons, and Ammunition Suitable for FTP Ranges

Range	Description	Weapons	Ammunition
1	Hand grenade and demolitions, two throwing bays	Fragmentation and concussion grenades and demilitarization	Charges less than 200 lbs
2	Machinegun familiarization, 10 firing points	.30 cal, .50 cal, and M60 machineguns	Ball and tracer, no armor piercing
3	Miscellaneous small arms weapons firing	M79, M203, and 66-mm LAW	40-mm PRACTICE 66-mm HEAT
4	Pistol qualification, shotgun familiarization	Pistols and shotguns—all types	Appropriate to weapon
5	Combat pistol qualification, 15 lanes	Pistols and revolvers	Appropriate to weapon
6	Record fire range, 16 lanes	M16, M60, and .30 cal	Ball and tracer, no armor piercing
7	Record fire range, 16 lanes	M16, M60, and .30 cal	Ball and tracer, no armor piercing
8	Field fire, 34 lanes	M16, M60, and .30 cal	Ball and tracer, no armor piercing
9	Zero fire and Course "C", 100 firing points	M16, M60, and .30 cal	Ball and tracer, no armor piercing
10	1/10-Scale indirect fire range	14.55 mm and 81 SABOT	Appropriate to weapon
11	Tank tables IV, V, VI, VII, and zero	.50 cal, 7.62 recoilless rifles, 105 mm, and 40 mm	Appropriate to weapon, 40-mm PRACTICE and 105-TPT*
12	Tank tables I, II, III, and M16 zero fire and Course "C"	7.62, .30 cal, M16, and .50 cal	Appropriate to weapon, armor piercing allowed
13	Tank tables IV, V, VI, VII Tank boresight and recoilless rifles and M42	.50 cal, 7.62, 105 and recoilless rifles, and M42	Appropriate to weapon, 105-TPT only
14	Tank tables I and II sub-caliber, M16 zero fire and Course "C"	7.62 and .50-cal M16	Appropriate to weapon, armor piercing allowed
15	Tank tables IV, VI CEV course and helicopter gunnery	.50 cal, 7.62, 105 recoil-less rifles, and M42	Appropriate to weapon, armor piercing allowed

Table 2.1-3. Activities, Weapons, and Ammunition Suitable for FTP Ranges (Continued, Page 2 of 2)

Range	Description	Weapons	Ammunition
16	Tank tables VII and VIII	M60, .50 cal, 105-mm	Appropriate to weapon, 105 TPT only
17	Miscellaneous small arms weapons firing	M16, M60 Claymore	Appropriate to weapon, armor piercing allowed
18	Forced march live fire squad positions	M16, M60, M203	Ball and tracer, no armor piercing
19	Machinegun familiarization, 6 lanes	M16 and M60	Ball and tracer, no armor piercing
20	Miscellaneous small arms weapons firing	M79, M60, M16, and Claymore	Ball and tracer, no armor piercing

* TPT = Target Practice with Tracer.

Source: FTP, 1981a.

white phosphorus rounds. The ranges and impact areas are well marked with warning signs.

An indoor pistol range (Bldg. 869) has been closed, because the ventilation reportedly was not adequate to control exposure to lead aerosols, according to Occupational Safety and Health Act (OSHA) standards.

Table D-1, App. D, provides information on the types and approximate amounts of ammunition used on the ranges. It shows the ammunition expended at FTP in 1973.

2.1.7 TOXIC/HAZARDOUS MATERIALS (HANDLING AND STORAGE)

Pesticides

Pesticides are handled at FTP by two divisions within DFAE: (1) insecticides and rodenticides by the Buildings and Grounds Division, and (2) herbicides by the Improved Grounds Division.

1. Buildings and Grounds Division

   Storage: Insecticides and rodenticides are stored in one-half of Bldg. 240. This building has a concrete floor without a drain. The ceiling and wall dividing the building were constructed of sheetrock, and the roof is made of wood. Consequently, Bldg. 240 is not fire resistant. There is no curbing across the door sill or along the sheetrock wall to contain pesticide spills, contrary to Federal guidelines (EPA, 1981b). Pesticides are segregated according to type and are marked with signs. An inventory is given in Table 2.1-4. Pesticide warning signs are posted on the outside of the building. Bldg. 240 has been used for pesticide storage for about 4 years. Prior to that, pesticides were stored in Bldg. 2404, a brick building which formerly housed an incinerator (USAEHA, 1976).

   Mixing and Formulation: Formulation of pesticide solutions is performed in a sink in Bldg. 232, a wooden structure which also houses the pest control shop office. The pesticide mixing room is

Table 2.1-4. Inventory of Pesticides in Bldg. 240 on FTP

Pesticide	EPA Registration No.	Container	Quantity
Insecticides/Rodenticides			
Baygon Bait (2%)	3125-121-ZA	5-lb jars	2
Baygon 1.5 (13.9%)	3125-214-ZA	1-gal* cans	18
Chlordane (72%)	876-63-AA	5-gal cans	8
O-Phenothrin (2%)	901-79	12-oz† aerosol	34
Diazinon 4E	7273-131	1-gal can	12
Diazinon Dust (2%)	None listed	25-lb can	1.5
Dursban M	464-368	5-gal can	4
Dursban 10 CR	464-517	Drum	0.5
Malathion (57%)	5602-46	1-gal can	4
Omicide (3%)	656-450-998	1-gal can	5
Rodenticide (0.5%)	None listed	1-lb can	5
Sevin Dust (39%)	1016-43	10-lb bag	47
Warfarin (0.025%)	12455-15AA	5-lb can	11
Zinc Phosphide	None listed	1-oz containers	85
Herbicides			
Pramitol	None listed	5-gal can	6
Diuron (80% WP)**	352-247-AA	50-lb drum	6
Round-Up®	524-301B-AA	1-gal jug	1
2-2 Low Volatile Brush Killer® EC†† Active Ingredients: [2,4-D (34.7%) and 2,4,5-T (31.1%)]	359-179-7273	1-gal can	18

* gal = gallon.
† oz = ounce.
** WP = Wettable powder.
†† EC = Emulsifiable concentrate.

Source: ESE, 1981.

separate from the office and has a door which is kept locked. The sink drain is connected to the sanitary sewer system.

Disposal: Pesticide containers are reportedly triple rinsed and disposed of in the post sanitary landfill. Rinse waters are placed into a common holding tank and then used as a diluent for subsequent pesticide formulations. This practice could result in the use of incompatible pesticides.

2. Improved Grounds Division

Very little herbicide use occurs at FTP. Plants growing in cracks of concrete are controlled as needed. During fiscal year 1981 (FY81), 6 ha were treated with 41 percent Round-Up® concentrate at a rate of 2 liters per hectare (l/ha) (FTP DFAE, 1981b).

Storage: Herbicides are stored in Bldg. 240, the insecticide/rodenticide storage building (see above discussion). A current inventory of herbicides is given in Table 2.1-4. Prior to storage in Bldg. 240, herbicides were stored in Bldg. 671.

Mixing and Formulation: Herbicides are mixed on the parking lot outside Bldg. 240 (USAEHA, 1979). There is no impervious curbing available at the outside formulation site to contain a pesticide spill or tank overflow. Prior to the use of this site, herbicide mixing was performed in Bldg. 671, the former herbicide storage facility (USAEHA, 1976).

Disposal: Herbicide containers are disposed of in the sanitary landfill. Spray equipment and container rinse water are disposed of by spraying over the site previously treated. USAEHA (1976) reported that herbicide rinse waters had been disposed of in the past in a "soakage pit." The location of this pit could not be determined.

Polychlorinated Biphenyls (PCBs)

Out-of-service transformers are being stored in the open on an unbermed concrete pad which was formerly the foundation of a heating plant near the old hospital area. At the time of the site visit, 67 transformers were stockpiled at this location. All but 21 have been analyzed for PCB content. Of those analyzed, 28 contained PCBs [>50 parts per million (ppm)] and 18 were classified as non-PCB (<50 ppm). Labels were affixed to all PCB-containing items. [Subsequent to the site visit, all transformers which had been determined to contain PCB-contaminated fluid were removed (Jan. 14, 1982) for disposal by a commercial contractor, American Electric Corp. Testing of out-of-service transformers has been completed, and disposal of the remaining 21 PCB-contaminated transformers is scheduled for completion during July 15 to Oct. 15, 1982.]

This storage location does not meet Federal requirements for a PCB storage facility (EPA, 1980f). A covered, bermed facility, which does meet Federal requirements, had recently been constructed at this location; however, the roof was designed too low to allow a forklift to enter the facility, and the transformers could not be placed inside. Many of the transformers showed evidence of leakage.

A recent PCB spill occurred when an in-service transformer overheated and exploded on a pole near Bldg. 1082. It was reported that approximately 40 to 60 liters (l) of PCB fluids spilled onto the ground and asphalt road at the base of the pole. At the time of site visit, visible stains were present on the ground in an area measuring approximately 1 m by 3 m. A soil sample was taken and analyzed by USAEHA, who reported 61 milligrams per kilogram (mg/kg) of PCBs in the sample (USAEHA, 1981c). FTP DFAE personnel have recently taken additional samples for analysis by USAEHA to delineate the extent of the contamination before proceeding with eventual cleanup. [Subsequent to the site visit, follow-up sampling to determine the extent of PCB contamination has been accomplished. This evaluation included analysis of the top 10 cm of soil at three locations having greatest visible

evidence of spillage of transformer fluid. Sample analyses were performed by USAEHA. Test results showed that the PCB level at each sample location was less than 50 ppm. Additionally, the spill area has been covered with a 5-cm layer of clay soil sealing the area and preventing contact with humans or animals.]

Another transformer fluid spill reportedly occurred about 3 years ago when someone shot a hole in a transformer on a pole near Bldg. 4072. The fluids (approximately 70 l) ran down the pole to the ground. No soil sampling or cleanup was conducted. [Subsequent to the site visit, soil samples were taken (May 28, 1982) at the base of the transformer pole at Bldg. 4072, and arrangements have been made for USAEHA to perform PCB analyses.]

Chemicals

Various activities on FTP use chemicals in support of specific missions. These activities are: (1) the water test laboratories at the STP and WTP, (2) the photographic laboratory, (3) pest control services, (4) the health clinic, and (5) vehicle maintenance operations. The use and disposal of chemicals handled by each activity are discussed in Secs. 2.1.3 (Laboratory Operations), 2.1.6 (Pesticides), and 2.2.1 (Industrial Wastes). During the site visit, no incompatible chemical stocks were observed being stored together.

Agents (Chemical and Biological)

The search of records did not indicate that any lethal chemical or biological agents had been stored or used on FTP. Pyrotechnic rounds have been and are currently being used on FTP (see discussion in Sec. 2.1.6). Additionally, CS riot control agent is used for training activities. This is discussed in Sec. 2.1.5.

Radiological Materials

A soil moisture/density gauge (National Stock No. 6635-01-030-6896) is stored in Bldg. 765 of the ECS area. The building is kept locked, and

radiation warning signs are located on the outside of the building. This instrument contains sealed-sources of the radioisotopes cesium-137 and americium-241, and its use is permitted under U.S. Nuclear Regulatory Commission (NRC) License No. 21-01222-05, held by the U.S. Army Tank and Automotive Command, Warren, Mich. A recent USAEHA (1981b) survey of this storage facility found no health hazards associated with the storage of this instrument.

Aiming devices for the M72 LAW weapons contain sealed-source tritium (H^3). Prior to use, these devices are stored in a bunker in the ASP; following use, the devices are stored in a container in Bldg. 205 until sufficient quantities are accumulated to economically justify shipping them to the U.S. Army Armament Materiel Readiness Command (ARRCOM) located in Rock Island, Ill., which holds the material license for these items.

2.1.8 PETROLEUM, OILS, AND LUBRICANTS (POL) HANDLING AND STORAGE

POL is used in vehicle operations. Waste oil generated in the vehicle maintenance areas is stored in Tank 1558, Station 8. Station 8, formerly a POL fueling station, is currently used mainly by transient units on FTP. The waste oil recovery program is discussed in Sec. 2.2.1.

Thirty-three underground POL storage tanks are located on FTP (see App. E). Twenty-one tanks, with a total volume of 660,100 l, are currently being used. These tanks are reportedly leak checked yearly. The 12 tanks not in service are not leak checked.

Small quantities of POL, two to five 55-gal drums, are located in the working areas of maintenance facilities.

FTP has no above- or underground storage facilities currently in use of sufficient size to require the development of a Spill Prevention Control and Countermeasure (SPCC) Plan in accordance with Army Regulation (AR) 200-1 (U.S. Army, 1978).

2.2 DISPOSAL OPERATIONS

2.2.1 INDUSTRIAL WASTES

All industrial waste at FTP is generated by vehicle maintenance operations. Waste oil, the most common waste generated, is disposed of by the Baumgardner Oil Co., Fayetteville, Pa., contracted by DPDO. This contract has been in effect since March 1981. An average rate of approximately 3,000 l/month of waste oil is collected. Handling of waste oil by permanent personnel appears to be adequate, but handling by transient troops presents some problems. Waste and spillage were observed around Tank 1558 at Station 8.

In the past, waste oil was used to control dust in the larger vehicle parking areas. This practice was discontinued in the mid-1970s by direction of USAEHA.

Painting wastes are minimal. The largest painting operation is conducted by MATES, which disposes of waste solvents through DPDO. The paint booth operated by MATES in Bldg. 126 is not filtered, and the overspray is vented onto the ground under the vent assembly. Paint used in this operation contains lead and is visibly coating the ground behind the paint booth. [Subsequent to the site visit, soil samples were collected (May 27, 1982), and arrangements have been made for USAEHA to perform lead analyses.]

Battery electrolyte is disposed of by various methods at FTP. The MATES operation packages the spent electrolyte and transfers it to DPDO for disposal. The DS/GS operation neutralizes the electrolyte and washes it down a wash rack drain, which discharges to the stormwater system. The post motor pool (Bldg. 318) has a buried tank which contains limestone. The waste electrolyte is poured onto the limestone, which neutralizes the solution; wastes exit through the bottom of the tank into the soil.

The solvent PD-680 is used in the vehicle maintenance areas. The waste material containing this solvent is disposed of with the waste oil.

The drainage ditch in the 142 Motor Park Area historically received contaminated gasoline and waste battery electrolyte. This practice was discontinued in the late 1960s. This ditch currently receives area runoff and drainage from two uncontrolled wash racks in the MATES area near Bldgs. 135 and 127.

Eleven wash racks are located on FTP. Four of these are equipped with oil/water separators and discharge to the sanitary sewer system; four other wash racks are reportedly not in use. Three wash racks, two located in the MATES area near Bldgs. 135 and 127 and one at DS/GS Bldg. 1556, discharge to the stormwater drainage system. These wash racks are currently being used; however, they do not have NPDES permits, which is in violation of Federal and State regulations.

As required by the Resource Conservation and Recovery Act (RCRA), FTP has surveyed the generation rates of hazardous wastes at various sites and determined them to be low, qualifying FTP as a small-quantity (less than 1,000 kg per month) generator. EPA has been notified of FTP status. Review of generation rates by the IIA team confirms this status.

2.2.2 WASTEWATER TREATMENT

One STP operated by DFAE is located on FTP. The sewage from FTP and the Town of Blackstone is treated at this plant. The design capacity of this trickling filter plant is 22.7 million liters per day (MLD), but the plant is currently operating at 5.7 MLD. The plant provides greater than 90-percent removal of BOD_5 and total suspended solids (TSS) and is operated well within its NPDES permitted limits. Effluent chemistry data for this facility are shown in App. F. The treated effluent is discharged into a tributary of Hurricane Branch, which then flows into the Nottoway River. At the time of the site visit, an oil sheen was visible on the primary clarifiers. The STP operator indicated that occasional problems with oil and solids had occurred in the past; however, the plant continued to operate well within its NPDES permit limitations. No oil was visible in the effluent or in the receiving stream downstream of the discharge.

Sludge from the STP clarifiers is disposed of by landspreading at the base landfill.

The FTP potable WTP and its operation are discussed in detail in Sec. 2.3.1. A settling basin, which generates wastewater, is used in conjunction with this WTP. Alum sludge from the water treatment process is allowed to settle, and the clarified water is discharged to Hurricane Branch. The basin was designed so sludge would settle out in the first one-third of the basin. Pumps would then be used to remove the sludge and transfer it to the drying beds at the STP. Overloading has reportedly occurred, but the condition has not been severe enough to cause violations of NPDES permit limitations.

Holding Ponds

No holding ponds or lagoons exist on FTP.

Stormwater Drainage

Stormwater drainage on the installation is accomplished by a system of storm sewers and open swales and ditches. Drainage from the post cantonment area flows to either Hurricane Branch or Birchin Creek. No problems are associated with stormwater drainage onpost.

NPDES Permits

FTP has two NPDES permits for discharge of wastewaters: Permit No. VA0025194 is for the discharge of effluent from the STP, and Permit No. VA0005827 applies to the discharge from the flocculation sludge settling basin at the WTP. NPDES discharge limitations for these two effluents are listed in Table 2.2-1. The discharges from the STP and WTP are in compliance with the permits.

Two wash racks, located in the MATES area near Bldgs. 135 and 127, and one wash rack at DS/GS Bldg. 1556 discharge to the stormwater system. These wash racks do not have NPDES permits, which is in violation of Federal and State regulations (EPA, 1980a).

Table 2.2-1. NPDES Permit Limitations for FTP

Permit No.	Maximum Flow (MGD)*	Maximum BOD (mg/1)†	Maximum SS (mg/1)	pH min/max	Residual Chlorine (mg/1)	Minimum DO (mg/1)	Maximum Oil and Grease (mg/1)	Expiration Date
VA0005827 WTP	N/A**	N/A	30 Daily Average 60 Daily Maximum	6.0/8.5	N/A	N/A	N/A	Nov. 19, 1982
VA0025194 STP	6.0	30 Daily Average 45 Daily Maximum	30 Daily Average 45 Daily Maximum	6.0/8.5	1.0 minimum 1.5 maximum	5.0	N/A	Sept. 11, 1983

* MGD = million gallons per day.
† mg/1 = milligrams per liter.
** NA = Not available.

Source: FTP DFAE, 1981d.

2.2.3 SOLID WASTE

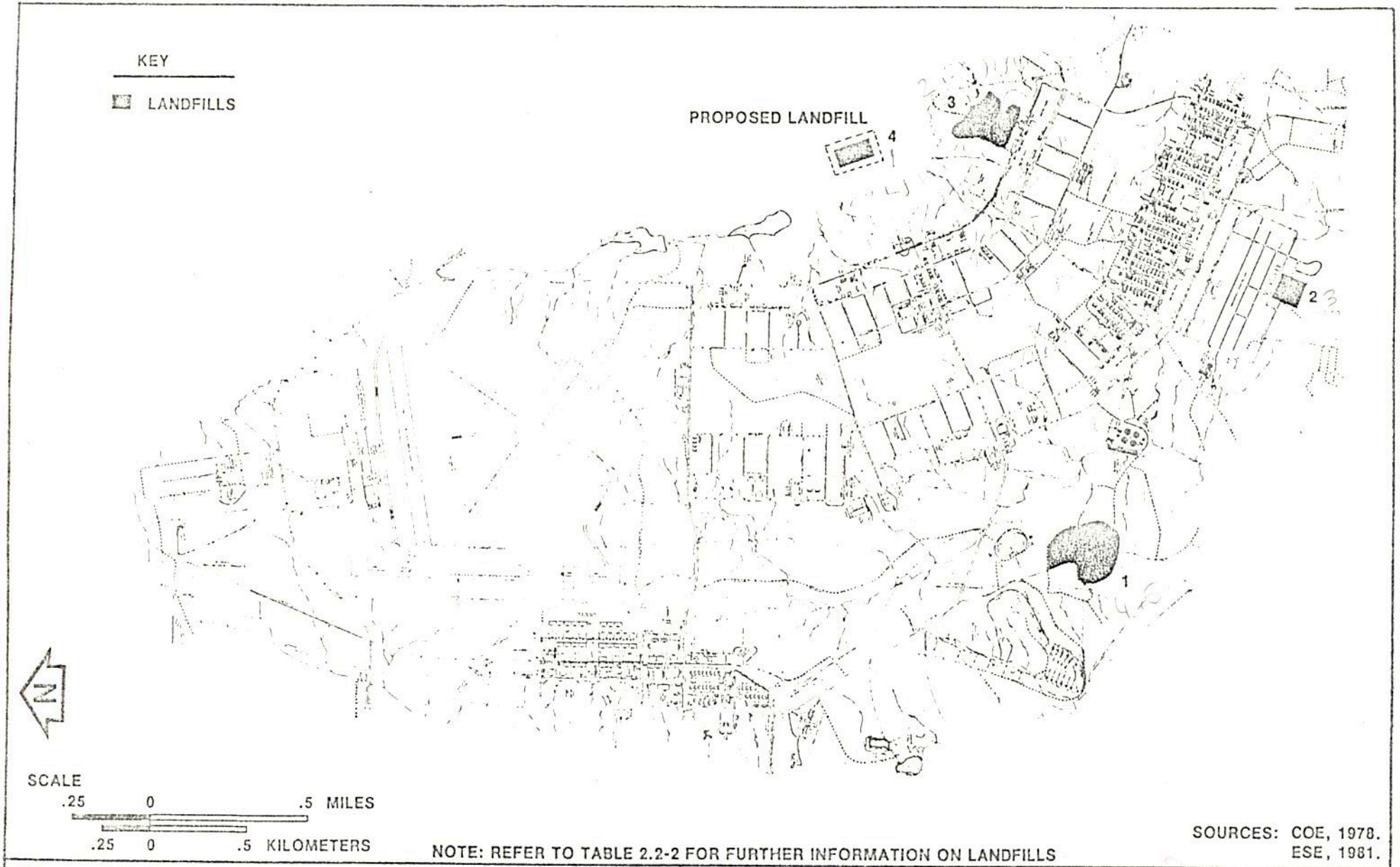
Three landfills reportedly exist on FTP. Two are inactive, and the current landfill is due to close in 1982. A new landfill has been permitted and is scheduled to open in 1982. A copy of the current landfill permit (No. 333) is found in App. G. The landfill is being operated in compliance with State regulations (Commonwealth of Virginia, Department of Health, 1971).

The locations of known landfills are shown in Fig. 2.2-1, and landfill data are summarized in Table 2.2-2. Past disposal operations reportedly involved selling putrescible garbage (until about 1967), incinerating flammable refuse (from 1941 to the mid-1950s), dumping ash and cinders in the landfill (until about 1945), and periodically dumping motor oil and kitchen grease into the landfill.

The current landfill at FTP (No. 3 on Fig. 2.2-1) is operated by dumping mixed construction debris and garbage in trenches and covering it with soil. The landfill behind the old hospital complex (No. 2 on Fig. 2.2-1) was reported to have received both construction debris and garbage and was operated for some time (dates unknown) as an open pit refuse burning area.

2.2.4 DEMOLITION AND BURNING GROUND AREAS

Explosive ordnance disposal (EOD) occurs in place or is conducted in the impact area. A Marine EOD detachment provides support in the fall and spring. The detachment conducts unscheduled sweeps of the controlled access impact area; no records are kept on the number and types of ammunition exploded; however, due to annual fluctuations in training activities and troop strengths, the total quantity of unexploded ordnance (UXO) and powder bags destroyed on an annual basis is reportedly not sufficient to classify FTP as a major generator or treatment facility under RCRA regulations. On request, the 147th EOD also provides EOD service to FTP. They conduct a subsurface sweep in part of the controlled impact area prior to the construction of new



NOTE: REFER TO TABLE 2.2-2 FOR FURTHER INFORMATION ON LANDFILLS

SOURCES: COE, 1978.
ESE, 1981.

Figure 2.2-1
LANDFILL LOCATIONS ON FORT PICKETT

Prepared for:
U.S. Army Toxic and Hazardous Materials Agency
Aberdeen Proving Ground, Maryland

Table 2.2-2. Summary of FTP Landfill Data

Landfill No. (see Fig. 2.2-1)	Date Opened	Date Closed	Type of Refuse	Type of Disposal	Miscellaneous
1	1943	1945	Unknown	Unknown	8-in* to 12-in trees in the area
2	1945(?)	1981	Construction debris and garbage	Trench, burning	
3	mid 1960s	Open	Mixed dumping of construction debris and garbage	Trench	
4	--	--	--	---	Proposed landfill to open in 1982

* in = inch.
-- = Not reported.

Source: ESE, 1981.

ranges and also clear reported UXO. Excess powder bags issued at the ASP are destroyed by burning near each firing point. The demolition and burning activities are conducted in compliance with the minimum distances specified by EPA (1981a).

Table 2.2-3 is a compilation of information from Explosive Ordnance Incident Reports obtained from the 147th EOD. It provides information on the locations and types of duds exploded at FTP in 1981.

In a sweep of Ranges 12 and 13 in 1980, the following items were reported destroyed: 61 artillery/mortar rounds, including 155-mm, 4.2-in mortar, and 90-mm and 105-mm high explosive (HE); and 106-mm HE, and 66-mm LAW.

2.2.5 DEMILITARIZATION

No demilitarization activities other than UXO demolition occur on FTP. No records were found to indicate any past demilitarization activities occurred onpost.

2.3 WATER QUALITY

2.3.1 POTABLE

The raw water supply for FTP is drawn from the Nottoway River Reservoir and is pumped to the FTP WTP. The FTP WTP also supplies the town of Blackstone, Va., which purchases the water under a contract administered by FTP DFAE (see App. B).

Operational surveillance of the drinking water is conducted by WTP personnel both at the WTP and in the distribution system. Medical surveillance of the FTP drinking water distribution system is conducted by the Preventive Medicine (PVNTMED) activity at FTL. The medical program consists of taking five samples weekly in the distribution system for pH, chlorine residuals, and coliform analyses. Samples are taken by WTP personnel who perform the onsite pH and total chlorine

Table 2.2-3. Duds Reported and Exploded on FTP in 1981

Type	Quantity	Location
Signal Flare M126 A-1	NR*	Range 3
M72 LAW	11	NR
35-mm LAW Subcaliber	2	NR
MK1 Illumination Grenade	1	NR
2-in Illumination Round	4	Range 13
106 HEAT Recoilless Rifle	NR	NR
40-mm HE	1	Range 3
35-mm Subcaliber	17	NR
3.5-in HEAT Rocket	9	NR
M72 LAW	1	NR
20-mm Practice	100 Rounds	NR
155-mm HE	1	Impact Area
40-mm HE	2	NR
81-mm HE	2	NR
M72 LAW	8	Range 3
M73 35-mm Subcaliber	12	NR
4.2-in Mortar HE	1	NR
60-mm Mortar HE	1	NR
TP-T (Target Practice Tracer)	23	NR
155-mm HE	7	In front of Observation Post
105-mm HE	3	NR
4.2-in HE	1	NR
81-mm HE	2	NR
35-mm M73 Subcaliber	1	Range 3
19A WP Rifle Grenade	19	NR
Artillery Simulator	NR	NR
3.5 Rocket Practice	NR	NR
155-mm HE	1	NR
40-mm HE	4	Observation Post No. 1
.50 Caliber	6	NR
M8 Smoke Grenade	1	NR
M67 Hand Grenade	1	Post Stadium
M83A3 60-mm Illumination Mortar (empty)	NR	Range 1
4.2-in M335 Illumination Rounds (training aids)	25	NR
4.2-in HE	NR	Firing Point 23A
81-mm HE	1	Range Control
81-mm WP	NR	Range Control

* NR = Not reported.

Source: Compiled by ESE from Explosive Ordnance Incident Reports, 1981.

measurements on an aliquot of the samples and send their results with the remaining aliquots to FTL via courier. USAEHA (1978a) found this frequency of sampling, as well as the method of collection and analysis of the samples, adequate for the population served.

The raw and treated water were sampled by USAEHA (1978b) during 1972-77 as part of the U.S. Army Drinking Water Surveillance Program (USADWSP). Analyses (App. H) included trace metals, pesticides, radioactivity, and major ions. Concentrations of trace metals, pesticides, and radioactivity in both the raw and finished water were very low and were well within the National Interim Primary Drinking Water Regulations (NIPDWR) maximum contaminant levels (EPA, 1980c). Additionally, the water meets the National Secondary Drinking Water Regulations (NSDWR) standards (EPA, 1979). The NSDWR secondary contaminant levels pertain to chloride, sulfate, color, iron, manganese, pH, total dissolved solids (TDS), and zinc. The NIPDWR and NSDWR contaminant levels are contained in App. H.

The treated water is currently being sampled monthly by the USAEHA Extended Trihalomethane (THM) Surveillance of Army Drinking Waters (USAEHA, 1981a). THMs averaged 207 micrograms per liter (ug/l) in the finished water during the period July 1980-June 1981. This level is in excess of EPA's NIPDWR maximum contaminant level of 100 ug/l, effective November 1983, for systems serving 10,000 to 75,000 consumers. Currently, FTP is requesting policy guidance from TRADOC for programming of possible plant modification to reduce THMs to meet the Federal regulations. [Subsequent to the site visit, FTP reported that TRADOC has recommended that FTP not program for plant modifications to reduce THM levels or pursue further studies.]

2.3.2 SURFACE

Most of the installation is drained by the Nottoway River and its tributaries. The principal tributary is the Little Nottoway River, and others include Birchin Creek, Hurricane Branch, and Tommeheton Creek.

The Nottoway River and its tributaries lie within the Chowan River Basin. The Nottoway Reservoir has been formed by impounding the Nottoway River at the southwest corner of the installation. This reservoir occupies 156 ha and is the raw water source for FTP. The Nottoway River and its tributaries are Virginia Class III waters. Virginia water quality standards for surface public water supplies and water quality criteria for Virginia surface waters are contained in App. I.

Surface water quality data are available for the Nottoway Reservoir, which was sampled during 1972-77 by USADWSP (USAEHA, 1978b) because it is the raw water source for FTP and the City of Blackstone, Va. Chemical parameters included major ions, trace metals, pesticides, and radioactivity. These data are contained in App. H. Average concentrations of silver, cadmium, and mercury in the reservoir exceed the Class III criteria for these metals. It should be noted, however, that the concentrations of these metals are well below the Virginia standards for surface public water supplies. The water quality criteria are designed to protect the most sensitive aquatic life, and, thus, are more stringent than the potable water standards. The concentrations of these metals in the reservoir likely arise from natural sources as there are no industrial contributors in the reservoir watershed. The FTP STP receives all the wastewaters from FTP and the City of Blackstone, Va., and following treatment discharges into Hurricane Branch which empties into the Nottoway River downstream of the reservoir.

As shown in App. H, pesticide levels in the reservoir were below analytical detection, and no significant levels of radioactivity were found.

Surface water quality data are also available through EPA's STORET data base for the Nottoway River near Rawlings, Va., located near the southeastern corner of the reservation (EPA, 1981c). These data are contained in App. J and include major ions only, no trace metals or organics. Based on their water chemistry, the Nottoway River and

Nottoway Reservoir would be characterized as soft, sodium-calcium-magnesium bicarbonate-type waters of near neutral pH.

The available water quality data do not indicate the migration of toxic or hazardous materials from FTP.

2.3.3 SUBSURFACE

The groundwater system at FTP exists as a multiaquifer system, with producing zones in lenses of sand or gravel in sediments overlying the bedrock, in the gravels of the saprolite zone, or in fractures in the underlying bedrock. Depth to the water table ranges from 1.7 m to 10 m below land surface on the installation.

No chemical data are available for ground water on FTP; however, groundwater data are available for three wells located in Dinwiddie County. The eastern portion of FTP occupies a portion of Dinwiddie County. The chemical analyses (Table 2.3-1) indicate that the ground water is of soft to moderate hardness, contains moderate levels of dissolved solids, and is principally a calcium-sodium bicarbonate-type water. No data are available to assess quality with regard to toxic or hazardous substances.

2.4 AIR QUALITY

2.4.1 AMBIENT AIR QUALITY

FTP is located in portions of Nottoway, Lenenburg, Brunswick, and Dinwiddie Counties, placing it in both Virginia Region 3 [the Central Virginia Intrastate Air Quality Control Region (AQCR)] and Virginia Region 5 (the State Capital Intrastate AQCR). Because FTP is located in an area where atmospheric inversions are not common and, additionally, is not located in a major industrial area, air pollution episodes generally do not occur (FPC, 1974).

2.4.2 SOURCE EMISSIONS

There are 11 No. 2 Fuel Oil burning units in year-round use at FTP, ranging in capacity from 0.4 to 5.6 million British thermal units per

Table 2.3-1. Chemical Analyses of Three Wells Located in Dinwiddie County

Parameter*	Well No. 1	Well No. 2	Well No. 3
Depth (m)	210	51	35
Silica	--	41.0	--
Iron	--	0.65	--
Calcium	--	40.0	--
Magnesium	--	7.3	--
Sodium	--	25.0	--
Potassium	--	6.1	--
Bicarbonate	292.0	214.0	101.0
Sulfate	15.0	7.6	5.0
Chloride	23.0	2.6	3.0
Fluoride	7.7	0.3	0.2
Nitrate	0.0	0.33	0.0
Total Dissolved Solids	--	232.0	--
Total Hardness (as $CaCO_3$)	15.0	130.0	78.0

* All values mg/l unless indicated otherwise.
-- = Not reported.

Source: Cederstrom, 1946.

hour (BTUs/hr). There are an additional 138 No. 2 Fuel Oil burning units used on an as-needed basis to accommodate USAR and National Guard training. These units have capacities ranging from 0.17 to 1.7 million BTUs/hr. Liquified petroleum gas (LPG) is used for water heating and cooking in mess halls onpost. These mess halls are used in support of USAR/National Guard training exercises. Emission estimates from the various stationary fuel burning units have been calculated by the FTP DFAE (1975). These estimates are as follows:

Pollutant	Emission Rate (kg/yr)*
Particulates (TSP)	3,582.7
Sulfur oxides (SO_x)	41,377.3
Carbon monoxide (CO)	1,433.06
Nitrogen oxides (NO_x)	3,446.6
Hydrocarbons (HC)	861.7

*kilograms per year.

Due to the small size and intermittent use of most of the fuel burning units, no problems or impacts on ambient air quality would be expected.

2.4.3 PERMITS

No State permits reportedly are required for the fuel burning units onpost, due to the small input capacity of these units. USAEHA (1974) concluded that all FTP stationary fuel units burning No. 2 fuel and LPG are in operational compliance with Virginia State particulate, visible, and sulfur oxides emission standards.

2.5 IMPACTS OF PAST AND CURRENT ACTIVITIES ON BIOTA

Impacts of military activities on managed woodlands include extensive damage to sawtimber-sized trees and young planted pines. Although they are outside the training areas, trees are reportedly knocked down by military personnel during heavy vehicle maneuvering. The use of flares in dry weather causes forest fires; areas burned annually in wildfires since 1975 ranged from 10.5 to 113 ha (FTP DFAE, 1981a). Controlled burning is conducted in the impact area to reduce the danger of wildfire.

As additional lands are cleared for installation development, woodland hectarage will be reduced. The area that will be cleared is not known. Areas cleared in 1979, 1980, and 1981 to provide new training grounds, ranges, and a landfill totalled 100, 14, and 19 ha, respectively (FTP DFAE, 1981a).

Wetlands are impacted by severe uncontrolled soil erosion in heavy track vehicle maneuvering training areas.

3.0 INSTALLATION ASSESSMENT

3.1 FINDINGS

3.1.1 METEOROLOGY

The annual mean temperature of the Blackstone, Va. area is 13°C, with a maximum monthly mean temperature of 25.5°C occurring in July and a minimum monthly low temperature of 3.5°C in January. Precipitation averages 107 cm annually, with snowfall averaging 39 cm. Winds prevail from the south-southeast at an average velocity of 0.4 m/sec.

3.1.2 GEOLOGY

FTP is located on the Piedmont, about 16 km west of the fall line. Igneous and metamorphic rock underlying the installation are highly irregular, due to intense weathering. The rock is exposed at the surface in some areas and may be in excess of 15 m below land surface in other areas. Four major soil associations overlie the rock surface on the installation and consist primarily of silts, sands, and clays.

3.1.3 HYDROLOGY

The southern half of FTP lies within the Chowan River Basin, which is drained by the Nottoway River and its tributaries. The northern half of the installation is drained by Butterwood Creek. A reservoir on Nottoway River provides a source of potable water to the installation and to the Town of Blackstone.

The groundwater system at FTP exists as a multiaquifer system, with producing zones in lenses of sand or gravel, in the saprolite zone, or in fractures in the underlying base rock. Depth to the water table ranges from 1.7 to 10 m below land surface on the installation. The general direction of groundwater flow is toward topographically low areas, where discharges to lakes and streams occur.

3.1.4 BIOTA

FTP has an active program of woodland and wildlife management on the installation. Woodland management consists of a 5-year cycle of cutting loblolly pine and yellow poplar and selective harvesting of mixed-species of mature timber. Wildlife management includes deer, turkey, and rabbits, and game fish in 11 lakes and ponds.

No federally listed threatened or endangered species of flora or fauna have been observed residing on FTP.

3.1.5 LEASES AND AGREEMENTS

A variety of easements are in effect on FTP, including rights-of-way for a public road, an irrigation waterline, and overhead and underground telephone cables. VPI leases 458.5 ha of land on FTP for operation of an agricultural research center. Contracts are in effect between FTP and the town of Blackstone, Va., to supply the town with potable water and sewage treatment services.

3.1.6 LEGAL CLAIMS

In 1980, the Government settled out of court for $145,000 in a law suit stemming from a 1977 incident in which a local teenager removed a 40-mm grenade from one of the ranges on FTP. The boy brought the grenade to a high school shop class and attempted to cut it in half. The grenade exploded, killing one boy and injuring five others. The range area was posted and the grenade was removed without authorization. The Government was one of five defendants, including the school and the parents of the boy who picked up the dud.

3.1.7 INDUSTRIAL OPERATIONS

The major industrial operation at FTP is vehicle maintenance, conducted at the following four locations:

1. DS/GS, operated by DIO in Bldg. 1556;
2. The motor pool at Bldg. 318, operated by DIO;

3. MATES, operated by VaARNG in Bldg. 130; and
4. ECS at Bldg. 564, operated by USAR.

Major vehicle repair, such as engine overhaul, battery maintenance, and body work (including painting), are performed at the DS/GS and MATES sites; the other two facilities perform daily operational maintenance such as oil changes.

A paint spray booth in Bldg. 126 is not equipped with an air filter. Overspray paints containing lead are deposited on soils outside this building. [Subsequent to the site visit, soil samples were collected (May 27, 1982), and arrangements have been made for USAEHA to perform lead analyses.]

There are no lessee industrial operations on FTP, and no records were found to indicate that any lessee operations have occurred at FTP in the past.

3.1.8 LABORATORY OPERATIONS

Laboratory operations on the installation include water test laboratories at the WTP and STP, a photographic laboratory, and a health clinic laboratory. The water test laboratories perform routine operational surveillance of the drinking water, including coagulation tests and pH, chlorine residuals, turbidity, and coliform tests. NPDES compliance monitoring is conducted at the STP laboratory. Parameters analyzed include pH, SS, BOD_5, chlorine residuals, and DO. Small quantities of reagent chemicals are stored and used at these laboratories. The spent solutions (100 lpy) from the photographic laboratory (Bldg. 1307) are sent to the FTL photographic laboratory for silver recovery. The health clinic performs no chemical analyses. Blood and urine samples are sent to Kenner Army Hospital at FTL for analysis. Spent X-ray developing solutions (40 l/month) are also sent to Kenner Army Hospital for silver recovery.

3.1.9 MATERIEL PROOF AND SURVEILLANCE TESTING

No materiel proof or surveillance testing is reportedly conducted at FTP.

3.1.10 TRAINING AREAS

FTP's mission is to support units of the Active Army, Reserves, and National Guard for training during 2-week annual periods in the summer and for Multiple Unit Training Assemblies during nonannual training periods in the winter. The only training activities involving hazardous materials are those using ordnance and riot control (CS) agents. Ordnance is used on designated range areas, and CS training occurs in a gas chamber building (Bldg. 709). NBC training exercises utilize talcum powder as a simulant. No lethal biological or chemical agents reportedly have been manufactured, stored, or used on FTP.

3.1.11 RANGES

There are 20 firing ranges on FTP, located on the periphery of a central impact area. The impact area has been in use since 1942. Reportedly, no chemical rounds have been used on the ranges. Pyrotechnic rounds are used, including 105-mm illuminating, 105-mm smoke, and 105-mm white phosphorus. The ranges and impact areas are well marked with warning signs.

3.1.12 TOXIC/HAZARDOUS MATERIALS (HANDLING AND STORAGE)

Pesticides (insecticides and herbicides) are stored in Bldg. 240. This building is not fire resistant and has a concrete floor without curbing; thus, it does not conform to Federal (EPA, 1981b) guidelines. Formulation and mixing occur in Bldg. 232. Pesticide rinse waters are placed in a holding tank and used as diluent for subsequent pesticide formulations. Empty pesticide containers are triple rinsed and disposed of in the post sanitary landfill.

The PCB storage facility is not bermed, contrary to Federal requirements for storage of PCB items (EPA, 1980f). [Subsequent to the site visit, all transformers which had been determined to contain PCB-contaminated fluid were removed (Jan. 14, 1982) for disposal by a commercial contractor, American Electric Corp. Testing of out-of-service transformers has been completed, and disposal of the remaining 21 PCB

contaminated transformers is scheduled for completion during July 15 to Oct. 15, 1982.] FTP DFAE is currently sampling the soil near Bldg. 1082 for PCB content to determine the extent of necessary cleanup from a transformer explosion in 1981. [Subsequent to the site visit, follow-up sampling to determine the extent of PCB contamination has been accomplished. This evaluation included analysis of the top 10 cm of soil at three locations having greatest visible evidence of spillage of transformer fluid. Sample analyses were performed by USAEHA. Test results showed that the PCB level at each sample location was less than 50 ppm. Additionally, spill area has been covered with a 5-cm layer of clay soil sealing the area and preventing contact with humans or animals.]

Chemicals are stored and handled at the WTP and STP water laboratories, the photographic laboratory, the health clinic, the pest control shop, and in the various vehicle maintenance areas. No incompatible chemical stocks were observed being stored together.

A soil moisture/density gauge containing sealed-sources of cesium-137 and americium-241 is currently stored in Bldg. 765. The NRC license covering this instrument is held by the U.S. Army Tank and Automotive Command, Warren, Mich. No health or environmental hazards are associated with the storage and use of this instrument on FTP.

M72 LAW aiming devices containing sealed source tritium (H^3) are stored in the ASP. Following use of the weapon, the aiming devices are stored in Bldg. 205 until sufficient quantities are accumulated to economically justify shipping them to ARRCOM, Rock Island, Ill., which holds the material license for these devices.

3.1.13 POL HANDLING AND STORAGE

Thirty-three underground POL storage tanks are located on the installation; however, only twenty-one are currently in use. The in-service tanks are pressure leak tested on an annual basis.

Small quantities (<1,000 gal) of POL are stored in 55-gal drums in the working areas of vehicle maintenance facilities. These areas are not bermed; however, since the total volume is less than 1,000 gal, any spills would be minor and would not require reporting under AR 200-1 (U.S. Army, 1978).

Waste oil is generated by vehicle maintenance operations at the rate of 3,000 l/month. Under DPDO contract, this waste oil is stored in Tank 1558, Station 8, until picked up by the waste oil recovery contractor (Baumgardner Oil Co., Fayetteville, Pa.). Handling of waste oil by permanent personnel is adequate, but handling by transient troops is a problem, and waste oil spillage around the drain into Tank 1558 has contaminated soils in that area.

3.1.14 SANITARY WASTEWATER TREATMENT

A trickling filter STP is operated on FTP by DFAE. This plant receives wastewater from FTP and the Town of Blackstone, Va. The town is billed by FTP at a nominal rate to cover only the cost to the Government. The design capacity of the plant is 22.7 MLD, but the plant typically operates at 5.7 MLD. More than 90-percent BOD and TSS removal is achieved by the plant, and it operates well within its NPDES permit limitations. Effluent is discharged into a tributary of Hurricane Branch, which then flows into the Nottoway River. Sludge from the STP clarifiers is disposed of by landspreading at the post landfill.

3.1.15 INDUSTRIAL WASTEWATER TREATMENT

The only industrial wastewater generated on FTP is wastewater from the operation of vehicle wash racks. All but ,three wash racks currently in use are equipped with oil/water separators and discharge into the sanitary sewer system. Waste oil from the oil traps is recycled with the waste motor oil (Sec. 3.1.13). Three wash racks, located in the MATES area near Bldgs. 135 and 127 and at DS/GS (Bldg. 1556), discharge to the stormwater system and are not equipped with oil/water separators. Additionally, these discharges are not covered by an NPDES permit, contrary to Federal regulations (EPA, 1980a).

3.1.16 LANDFILLS/DISPOSAL AREAS

Three landfills exist on FTP, two of which are inactive. The current landfill is due to close in 1982. A new landfill has been permitted and is scheduled to open in 1982 when the current landfill ceases operation. The current landfill is permitted (Permit No. 333) by the State and is being operated in accordance with State regulations.

3.1.17 CONTAMINATED WASTES

The only contaminated waste generated by FTP is waste POL, which is recovered and recycled by a contractor (Sec. 3.1.13).

3.1.18 DEMOLITION AND BURNING GROUND AREAS

Disposal of explosive ordnance occurs in place or is conducted in the impact area. The 147th EOD unit provides EOD service to FTP on an as-needed basis. Excess powder bags issued at the ASP are destroyed by burning near each firing point. Due to annual fluctuations in training activities and troop strengths, the total quantity of UXO and powder bags destroyed on an annual basis is not sufficient to define FTP as a generator or treatment facility under RCRA regulations.

3.1.19 WATER QUALITY

The raw water supply for FTP is the Nottoway River reservoir. Treatment at the FTP WTP consists of chemical addition (lime, alum, and activated carbon), followed by flocculation, sedimentation, filtration, and disinfection. The FTL WTP also supplies the Town of Blackstone, Va., which purchases the water under a contract administered by FTP DFAE. Sludge from the coagulation-flocculation process is gravity fed to a settling basin. Effluent from this settling basin, is discharged over a weir to Hurricane Branch under NPDES permit.

Operational surveillance of the finished water is conducted by WTP personnel and medical surveillance is conducted by the FTL PVNTMED activity. Chemical analyses of the drinking water indicate that the water meets current NIPDWR and NSDWR (EPA, 1980c; 1979). THM levels in

the potable water averaged 207 ug/l during July 1980-June 1981. This level is in excess of EPA's NIPDWR (1980c) maximum contaminant level of 100 ug/l, effective November 1983, for systems serving 10,000 to 75,000 consumers. FTP is currently requesting guidance from TRADOC for programming for possible plant modifications to reduce THM levels to meet the Federal regulations. [Subsequent to the site visit, FTP reported that TRADOC has recommended that FTP not program for plant modifications to reduce THM levels or pursue further studies.]

FTP is drained primarily by the Nottoway River and its tributaries, which have been designated Virginia Class III waters. Available water quality data indicate that the Nottoway River meets Virginia Class III criteria, with the exception of silver, cadmium, and mercury which slightly exceed the criteria. The levels of these metals, however, are well below the State potable water standards for surface water supplies. These metals likely arise from natural sources, as there are no industrial contributors to the watershed in the area. Pesticide levels were below analytical detection, and no significant levels of radioactivity were found.

No analytical data are available for ground water on the installation; however, data are available for wells in Dinwiddie County. These data indicate that the ground water is soft to moderately hard, contains moderate amounts of dissolved solids, and is principally a calcium-sodium-bicarbonate-type water.

3.1.20 AIR QUALITY

FTP is located in both the Central Virginia Intrastate AQCR and the State Capital Intrastate AQCR. Due to the rural nature of the area, air pollution episodes generally do not occur. Various fuel oil and LPG burning units are located on FTP, with most being used intermittently due to fluctuations in training activities. No problems or impacts on ambient air quality would be expected to occur due to operation of these units on FTP.

3.2 DISCUSSION OF SIGNIFICANT FINDINGS

3.2.1 PAINT SPRAY BOOTH

A paint spray booth located in Bldg. 126 is not equipped with a filter. Overspray paints are therefore being deposited on soils in a 2-m by 2-m area adjacent to Bldg. 126. Some paints used in this paint booth contain lead, which is a toxic substance (EPA, 1980b). Therefore, the possibility exists that the soils may be a hazardous waste based on EP toxicity (lead). There is no potential for offpost migration of these paint residues; however, the paint-contaminated soils could present a health hazard if the soils are stirred up by workmen in the area and inhaled. Additionally, the paint residues would be toxic if ingested by animals (rabbits, birds, etc.). [Subsequent to the site visit, soil samples were collected (May 27, 1982), and arrangements have been made for USAEHA to perform lead analyses.]

3.2.2 PESTICIDES

Pesticides are stored in a non-fire-resistant structure (Bldg. 240) which does have a concrete floor; however, the floor is not curbed to contain possible spills, as recommended by Federal guidelines (EPA, 1981b). Accidental spillage of liquid pesticides in this facility would result in the pesticides running off the concrete foundation and the subsequent contamination of the soils around Bldg. 240. Stormwater runoff from this area drains into a small tributary of Hurricane Branch. The potential, therefore, exists for pesticides to enter this surface water, which could result in environmental damage.

3.2.3 PCBs

Out-of-service transformers are sampled for PCB content, labeled in accordance with Federal regulations, and stored on a concrete pad near the old hospital area. This storage facility is uncovered and is not curbed, contrary to Federal regulations (EPA, 1980f). A storage facility which meets the Federal regulations had recently been constructed in this area; however, the roof was not of sufficient height to permit a forklift to place the transformers inside this facility.

This storage area is located approximately 500 m from a small tributary of Hurricane Branch, and storm water draining this area enters this tributary. A casing failure or accident could release significant concentrations of PCB fluids into this tributary and, subsequently, offpost. At the time of the site visit, several of the PCB-containing transformers had visible leakage down the outside of the transformer casings. [Subsequent to the site visit, all transformers which had been determined to contain PCB-contaminated fluid were removed (Jan. 14, 1982) for disposal by a commercial contractor, American Electric Corp. Testing of out-of-service transformers has been completed, and disposal of the remaining 21 PCB-contaminated transformers is scheduled for completion during July 15 to Oct. 15, 1982.]

A transformer containing PCBs exploded during the summer of 1981 and contaminated soils at the base of a utility pole near Bldg. 1082. FTP DFAE is currently in the process of sampling these soils to determine the extent of necessary cleanup. [Subsequent to the site visit, follow-up sampling to determine the extent of PCB contamination has been accomplished. This evaluation included analysis of the top 10 cm of soil at three locations having greatest visible evidence of spillage of transformer fluid. Sample analyses were performed by USAEHA. Test results showed that the PCB level at each sample location was less than 50 ppm. Additionally, the spill area has been covered with a 5-cm layer of clay soil sealing the area and preventing contact with humans or animals.]

Another spill of transformer fluids occurred about 3 years ago when a transformer was punctured by rifle fire. The transformer was on a utility pole near Bldg. 4072. The fluids (estimated at 70 l) ran down the pole to the ground. No sampling of the fluids or the soil was performed to determine PCB content. [Subsequent to the site visit, soil samples were taken (May 28, 1982) at the base of the transformer pole at Bldg. 4072, and arrangements have been made for USAEHA to perform PCB analyses.]

Both PCB spills are located in areas of relatively flat terrain, and the volumes involved are such that surface migration is not a problem.

3.2.4 WASTE POL HANDLING AND STORAGE

Waste oil, generated by vehicle maintenance operations, is stored in Tank No. 1558 in the Station 8 area until picked up by the waste oil recovery contractor. The transfer operation of waste oils to this holding tank by FTP permanent personnel is adequate; however, handling by transient troops is a problem, and waste oil spillage around the transfer point at Tank No. 1558 has contaminated the soils in this area. The total volume of oil spillage at this location is less than 3,785 l, which would require reporting according to AR 200-1 (U.S. Army, 1978); however, surface runoff from this area enters a small tributary of Birchin Creek, and the potential exists for contamination of this stream and possible environmental damage.

3.2.5 WASH RACKS

Three wash racks, two located in the MATES area near Bldgs. 135 and 127 and one at DS/GS (Bldg. 1556), discharge into the stormwater system. These wash racks are not equipped with oil/water separators and the discharges are not covered by an NPDES permit in violation of Federal regulations (EPA, 1980d). The stormwater drainage system into which the wash racks near Bldgs. 135 and 127 discharge ultimately drains into a small tributary of Hurricane Branch. The wash rack at Bldg. 1556 discharges into a stormwater drain system, which empties into a tributary of Birchin Creek. No ecological damage or stress associated with the use of these wash racks was observed during the site visit; however, continued use of these wash racks increases the chance for potential damage, especially if oil and grease are discharged. All other wash racks currently in use on FTP are equipped with oil/water separators and discharge to the STP, which does have an NPDES discharge permit.

3.2.6 POTABLE WATER

Potable water on FTP does not meet NIPDWR (EPA, 1980c) maximum contaminant levels for THMs, effective November 1983. Current THMs average 207 ug/l, and the Federal standard is 100 ug/l. [Subsequent to the site visit, FTP reported that TRADOC has recommended that FTP not program for plant modifications to reduce THM levels or pursue further studies.]

3.3 CONCLUSIONS

1. Available geological evidence and information on contaminant sources do not indicate the migration of contaminants in significant quantities via surface or subsurface waters.
2. A paint spray booth in Bldg. 126 is not equipped with a filter; therefore, overspray paints are deposited on soils outside this building. Some paints used in this paint booth contain lead, which, if present in sufficient quantities, could present a potential health hazard [U.S. Environmental Protection Agency (EPA), 1980b].
3. Pesticides are stored in Bldg. 240, which is marked with warning signs indicating the storage of toxic and hazardous materials. Additionally, this facility has an impervious concrete floor; however, the floor is not curbed to contain possible spills, contrary to Federal guidelines (EPA, 1981b).
4. Out-of-service transformers are sampled for polychlorinated biphenyl (PCB) content, labeled in accordance with Federal regulations, and stored on an uncovered, unbermed concrete pad near the old hospital area. This storage area does not conform to Federal regulations (EPA, 1980f).
5. Several out-of-service, PCB-containing transformers had visible leakage down the outside of the transformer casings. These items are not being maintained in accordance with Federal regulations (EPA, 1980f).
6. A transformer containing PCBs exploded during the summer of 1981 and contaminated soils at the base of a utility pole near Bldg. 1082. FTP Directorate of Facilities Engineering (DFAE) is currently in the process of sampling these soils to determine the extent of necessary cleanup (EPA, 1980f).
7. A spill of transformer fluids occurred about 3 years ago at the base of a utility pole near Bldg. 4072. Soils in this area are potentially contaminated with PCBs. No sampling of the fluids or the soil was performed to determine PCB content (EPA, 1980f).

8. The transferring of waste oils to a holding tank (No. 1558) by FTP permanent personnel is conducted in an adequate manner; however, handling by transient troops is a problem, and waste oil spillage around the transfer point has contaminated soils in this area (U.S. Army, 1978).
9. Three wash racks, two located in the Mobilization and Training Equipment Site (MATES) area near Bldgs. 135 and 127 and one at Direct Support/General Support (DS/GS) (Bldg. 1556), discharge into the stormwater system. These discharges are not covered by a National Pollutant Discharge Elimination System (NPDES) permit, thereby violating Federal regulations (EPA, 1980d).
10. As is the case for many Federal and municipal potable water treatment plants (WTPs) throughout the country, the drinking water for FTP exceeds the Federal standard of 100 micrograms per liter (ug/l) for trihalomethanes (THM), which must be achieved by Nov. 29, 1983 (EPA, 1980c).

3.4 RECOMMENDATIONS (KEYED TO CONCLUSIONS)

That USATHAMA should:

1. Not conduct a survey at this time.

That FTP should:

2. Subject the paint-contaminated soils near Bldg. 126 to the extraction procedure (EP) toxicity test for lead and take appropriate action*;
3. Properly store pesticides in Bldg. 240;
4. Properly store out-of-service polychlorinated biphenyl (PCB)-containing transformers*;
5. Continue to coordinate with the Defense Property Disposal Office (DPDO) to expedite the physical acceptance of PCB-containing transformers, and, in the interim, maintain out-of-service PCB-containing transformers in accordance with Federal regulations;
6. Continue the current program to clean up PCB-contaminated soils near Bldg. 1082*;
7. Determine if soils near Bldg. 4072 are contaminated with PCBs and take appropriate action*;
8. Clean up petroleum, oils, and lubricants (POL)-contaminated soils near Tank No. 1558 and take appropriate measures to prevent POL spillage at the POL transfer point;
9. Bring the two wash racks located in the Mobilization and Training Equipment Site (MATES) area near Bldgs. 135 and 127 and the one at Direct Support/General Support (DS/GS) (Bldg. 1556) into compliance with Federal regulations prohibiting unpermitted industrial discharges to surface waters.
10. Continue efforts to ensure that trihalomethane (THM) levels in the potable water meet Federal standards*.

*Subsequent to the onsite visit, the following actions have been reported by FTP (keyed to Recommendations):

2. Soil samples were collected on May 27, 1982, and arrangements have been made for the U.S. Army Environmental Hygiene Agency (USAEHA) to perform lead analyses;

4. On Jan. 14, 1982, all transformers which had been determined to contain PCB-contaminated fluid were removed for disposal by a commercial contractor, American Electric Corp. Testing of out-of-service transformers has been completed, and disposal of the remaining 21 PCB-contaminated transformers is scheduled for completion during July 15 to Oct. 15, 1982;

6. Follow-up sampling to determine the extent of PCB contamination has been accomplished. This evaluation included analysis of the top 10 centimeters (cm) of soil at three locations having greatest visible evidence of spillage of transformer fluid. Sample analyses were performed by USAEHA. Test results showed that the PCB level at each sample location was less than 50 parts per million (ppm). Additionally, the spill area has been covered with a 5-cm layer of clay soil sealing the area and preventing contact with humans or animals;

7. On May 28, 1982, soil samples were taken at the base of the transformer pole at Bldg. 4072, and arrangements have been made for USAEHA to perform PCB analyses; and

10. The U.S. Army Training and Doctrine Command (TRADOC) has recommended that FTP not program for plant modifications to reduce THM levels or pursue further studies.

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